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SPECIAL NORTH CAROLINA NUMBER

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July-August, 1958
Whole Number 265

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ROCKS & MINERALS

PETER ZODAC, Editor and Publisher
America's Oldest and Most Versatile Magazine for the Mineralogist, Geologist, Lapidary.

Published Bi-Monthly

OFFICIAL JOURNAL

ROCKS & MINERALS ASSOCIATION

WHOLE NO. 265 VOL. 33, Nos. 7-8 JULY-AUGUST, 1958

CONTENTS

MINERALS OF THE PEGMATITES OF CRABTREE, MITCHELL CO., N.C.—*James A. Ray* 291
MINERAL RESOURCES OF NORTH CAROLINA—*Fred Allen* 301
"OLD PLANTATION" EMERALD MINE—*Douglas B. Sterrett* 302
GEMSTONES OF NORTH CAROLINA—*George A. Bruce* 308
HIDDENITE, A NORTH CAROLINA GEM STONE—*Fred M. Allen, Jr.* 310
PYROPHYLLITE IN CENTRAL NORTH CAROLINA—*John Hanahan* 312
THE 100 COUNTIES OF NORTH CAROLINA—*C. Henry King* 315
GEOLOGY OF NORTH CAROLINA—*Fred Allen* 322
ITACOLUMITE IN NORTH CAROLINA—*Jasper L. Stuckey* 324
100 ROCKHOUNDS OF NORTH CAROLINA—*C. Henry King* 326
RADIOACTIVE MINERALS OF NORTH CAROLINA—*Mrs. Fred Allen* 328
WNC EMERALD MINES TO BE REOPENED—*Ashton Chapman* 330
THE DEVIL'S TRAMPING GROUND—*C. Henry King* 334
THE CHAPLAIN'S PAGE—*James C. Peck* 336

DEPARTMENTS

WOMEN'S CORNER OF R&M—*Conducted by Winnie Bourne* 332
FOSSIL DEPARTMENT—*Conducted by Howard V. Hamilton* 340
WITH OUR ADVERTISERS—*Conducted by James N. Bourne* 342

MISCELLANEOUS

CHIPS FROM THE QUARRY 290
THE MASTER ROCK HUNTER (poem)—*Bea Thomas* 300
XENOTIME-MONAZITE SAND FROM NORTH CAROLINA 311
THE HOT SPRINGS "WINDOW" OF NORTH CAROLINA—*Fred M. Allen, Jr.* 325
DESOTO WAS FIRST N.C. "ROCKHOUND"—*Mattilee H. Allen* 329
METEORITE FROM CASTALIA, N.C. 335
MEET YOUR EASTERN SHOW CHAIRMEN 338
NORTH CAROLINA HAS FOUR MINERAL SOCIETIES 339
TARHEEL TALUS—*C.H.K.* 341
EPIDOTE FROM BAKERSVILLE, N.C. 344

Entered as second-class matter Sepember 13, 1926, at the Post Office at Peekskill, N. Y. under the Act of March 3, 1879.

Title registered in U. S. Patent Office.

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Specially written articles (as contributions) are desired.
Subscription price $3.00 a year; Current numbers, 60¢ a copy. No responsibility is assumed for subscriptions paid to agents and it is best to remit direct to the Publisher.
Issued bi-monthly on the 20th of the even months.
Authors alone are responsible for statements made and opinions expressed in their respective articles.

ROCKS and MINERALS, BOX 29, PEEKSKILL, N. Y., U.S.A.
(Office — 157 WELLS STREET — Tele. Peekskill 7-3185)

CHIPS FROM THE QUARRY

SOME HIGHLIGHTS OF COMING EASTERN CONVENTION

Sondley Collection to Be Shown

The famed Alexander Sondley collection of gem stones, never before publicly displayed, has been acquired for display at the Eastern Federation of Mineral Societies Show in Asheville, North Carolina, August 7, 8, 9, 1958.

The Sondley collection consists of a vast number of North Carolina precious and semi-precious stones collected and cut in the early part of this century by Dr. Alexander Sondley. Included are more than 50 stick pins, rings and other jewelry of rubies, rhodolite garnet, emerald, aquamarine and many others, with a large number set in North Carolina gold.

Dr. Sondley maintained his collection in his home, where relatively few people saw it. It has been in a bank vault since his death in 1931 and will be transported to and from the show each day by armored car.

* * *

Federation Show Plans Advance

Plans for the huge Eastern Federation of Mineral Societies Show in Asheville, N.C., August 7, 8, 9, 1958, are virtually complete now.

Robert R. Williams, Jr., Executive Vice President of the Eastern Federation and General Chairman of the show, reported that all commercial display booths have been sold with a waiting list now on hand in the event arrangements may be made for additional commercial space. Reservations for competitive displays from individuals and societies indicate widespread interest from Maine to Florida and many foreign countries.

R&M will have Booth 33

ROCKS AND MINERALS will have Booth 33 at the Convention and the Editor would be very happy to greet any friends who may be in attendance.

Special exhibits already acquired, with many more promised, include a 1,270 carat North Carolina emerald loaned by the Smithsonian Institute, and never on display before; the $30,000 Refford Cate Jade and Rose Quartz collection, an outstanding fluorescent display with hourly lectures; a selection of cut stones by the outstanding lapidarist and author, J. Harry Howard, and many others.

The Southern Appalachian Mineral Society is host to the Federation Show.

* * *

Eight Days of Field Trips!

Eight full days of guided field trips to outstanding North Carolina mineral locations have been completely arranged to follow the week after the Eastern Federation of Mineral Societies Show in Asheville, N.C., August 7, 8, 9, according to the Southern Appalachian Mineral Society, host to the show.

Most of the locations are those which are not open to visiting collectors ordinarily, affording a wonderful opportunity to out-of-state collectors interested in the more than 300 minerals to be found in North Carolina.

Participation in the field trips will be limited to those registering at the Eastern Federation Show.

* * *

ROCKS AND MINERALS to Provide Service

Peter Zodac, Editor of ROCKS AND MINERALS, announces that this magazine will provide a unique registration service at the Eastern Federation of Mineral Societies Show in Asheville, August 7, 8, 9.

Visitors at the show may register at the ROCKS AND MINERALS booth, listing their name and where they are staying during the show. This will make it easy for those wishing to get in touch with rockhounding friends and to meet those from other sections with whom they may have corresponded or traded. Messages also may be left at this central location.

Minerals of the Pegmatites of Crabtree, Mitchell County, North Carolina

By JAMES A. RAY

12 Caledonia Road, Asheville, North Carolina

North Carolina, owing to the extreme complexity of its geologic history and structure, and highly variant rock types, has long been noted as a veritable "sample box" for the mineralogical collector, and student. As these lithologies have been frequently intruded, and re-intruded by rising magmas, of composition ranging from the acidic to the basic, they have been subsequently "cooked" and contorted into all manner of structural patterns. The resulting picture is one of widely varied mineralogical content, mineral species numbering over several hundred having already been identified.

This is particularly the case among the rugged mountain chain of the Southern Appalachians, which comprises the greatest portion of the western extent of the state. For here, the vast intrusions of pegmatites and peridotites have literally "peppered" this area with a variety of mineral species that is probably unrivaled in any other area of similar size. Of the large number of species so far identified, several were recognized as new ones altogether, and were first named here. The most notable of these are Hiddenite, Rhodolite, and Clarkeite.

Of this area, this article will be limited to the minerals of the pegmatites of the immediate area around Crabtree Creek, on the Mitchell-Yancey County Lines, and here specifically to three workings; The Crabtree Emerald Mine, The McKinney Feldspar and Mica Mines, and the #20 Feldspar and Mica Mine.

Also, only those species which the writer has either found himself, or seen found by others will be listed here. Certain official publications of the past have listed a great many more species, but the writer has never been fortunate enough to see specimens of these, much less find any of them.

Crabtree Emerald Mine. This is the more well-known of the two emerald mines of this state. It is located near Crabtree Mountain, at an approximate elevation of 3500-feet. This is about two and one half miles north, north-west of Little Switzerland.

The Crabtree Emerald Mine was first discovered in the early 1890's, and was mined until early 1900's. A number of gems were recovered, but most were of small size. The largest portion of the mine's production was not in loose emeralds but as "Emerald Matrices." These stones were cut "en cabochon" from the entire matrix, the resulting gems of bright green emerald, black tourmaline (schorl), and light-coloured pegmatite being quite unique and attractive.

As the emerald is embedded in a very tough matrix (some in a quartz-pegmatite, and others in a dense biotite gneiss), and it was necessary to do the bulk of the mining by the increasingly unprofitable process of manual labor (the use of explosives and other such drastic measures being "out of the question," since emerald dust and fragments are of little value. Who wants *Half* an emerald?), mining was soon shut down, and operations ceased.

Hence, since about the turn of the century, the mine has lain dormant, commercially speaking.

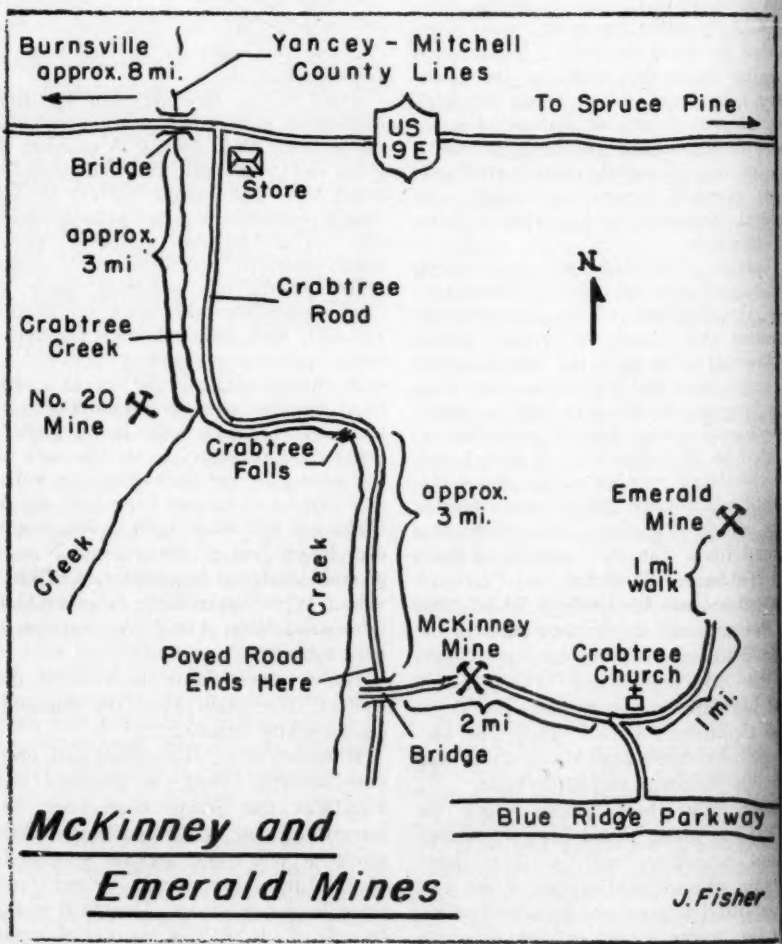
However, since that time, and until very recently, when the property was POSTED, the dumps have been upturned and overturned by literally thousands of collectors, seeking specimens of this the most highly prized (and priced!) of gem-stones. Though it is extremely doubtful that many real gems

have been so recovered, a great many very beautiful matrix specimens have been removed.

The emerald occurs as small (usually I-2mm in length), well-developed bright grass-green crystals in a quartzitic pegmatite. Associated with it are larger (and more abundant, of course) crystals of other colors of beryl, the yellow and yellow-green being the most common, and fine sharp crystals of schorl tourmaline, averaging about 3 x ¼ inch in size.

The deepest colored emerald, that is the greenest, seems to predominate along the contacts of the biotite gneiss. Commonly, if a rock from these dumps has a layer of this biotite on it, one can look for the best emerald to be embedded in the black biotite. This is particularly likely if the pegmatitic side of the rock shows some crystals or fragments of beryl.

McKINNEY MINE. This mine, located about three miles southwest of the emerald mine, is perhaps one of the largest workable areas of pegmatite. It



has produced, and still produces, at intervals, very large amounts of feldspars, and some greenish muscovite. It is one of the older, and more mineralogically prolific, of the pegmatite workings in this area.

The main cuts of this mine are shown in the photograph (#1) are three, horizontal drifts extending into the dike for at most some 100 feet.

The distance from the uppermost portion of the dike to the floor of the lower cut is approximately 190 feet. A clearer impression of the size of this portion of the mine can be obtained by noticing the relative sizes of the ore truck and worker in the lower center of the photograph.

The immediate area around the truck has often shown large masses of samarskite and columbite (about 3-5 lbs. each) as dark colored spots in the walls of the dike, and occasionally, as mining was underway in the past, the writer has noticed isolated masses of these minerals, which are the more abundant of the rarer species to be found here, of about 8-9 inches across, which would probably weigh 10-15 lbs. if they could have been removed intact. Unfortunately, though, when the mining progressed to these areas, the consequent effect of the dynamiting etc., usually resulted in many small pieces or fragments of these undesired (by the miners, at least) minerals, and what were choice specimens were thus reduced to oblivion. As these minerals are very brittle, and shatter easily, it is rare to obtain any large pieces after the containing walls have been blasted down. However, most of this "debris" usually found its way to the dumps, and, with a great deal of patience (and more luck), some nice pieces of these minerals are still to be found.

Several years ago, as the workings progressed along the outer and lower wall immediately to the right of the truck in the photo, it was noticed that the seams of the shattered pegmatites there were literally "painted" with bright sulfury - yellow, powdery uranophane. Several pieces of this pegmatite with a surface of 5-6 feet were almost completely coated with this mineral on one or two sides. Associated with it was a smaller quantity of autunite. However, as these two minerals are very delicate, they were all but completely destroyed as the rocks were moved, broken up, and dispatched to the dumps, and today, only a very few isolated small pieces are to be found.

In the same area, in the past, have been found large numbers of mica

Photo 1. View of the McKinney feldspar mine, Crabtree, Mitchell Co., N.C.

"books" of a greenish color (locally termed "A" or "V" mica in allusion to its "cleavage" resembling these two letters) which were highly sought by collectors, inasmuch as they contained flattened garnet crystals imbedded between the mica sheets. These are highly desired as mineral specimens. The garnets were usually as small (1-3-mm across) crystals of a bright orange to red color, and often exhibiting the six-side form of the enclosing mica. The thinness of these garnets was sometimes such that neither side would be exposed when the mica was cleaved to less than 1-mm thin. The past tense "were found" is used here as these specimens have all but completely disappeared now, due both to their demand by the collectors who have visited this location, often in small "armies", and also to the fact that it now appears that the miners are saving the mica, as very little shows up on the dumps anymore.

If the collector should stand with his back towards the rear wall of these main cuts, directly in front of him (south), at a distance of some 200-yards, is another large opening which has also yielded some fine specimens of several minerals, of which the more notable were hyalite opal and torbernite (this cut is shown in photograph #3). At several times in the past, as more and more of the walls of this portion were torn down (particularly the wall to the right of the photograph), these two minerals were noticed as coatings on the surfaces of some of the pegmatite blocks, and here, as with the uranophane previously mentioned, they often coated very large blocks on one or two sides. Again, however, these have all but disappeared from view. However, this portion of the mine is occasionally re-opened and more can be expected in the future.

It is far more advisable, and rewarding to limit one's collecting at this mine to the dumps, rather than to the actual workings themselves. For on the dumps are to be found a concentrated "cross-section" of those species to be found, and, disregarding the "wear and tear" affect many have undergone as a result of mining operations, it is a great deal easier, and quicker, to locate specimens here than at the workings. Also, there is much less opportunity for the overly-ambitious collector to purchase his "one-way" ticket to the "Rockologist's Happy Hunting Ground" by cascading a few tons of pegmatite upon his traditionally hard head, or of taking a nose-dive down the slopes of the walls, only to arrive

Photo 2. Uranophane, as bright sulphur-yellow to orange coatings, occurs in the floor directly at the entrance to the lower tunnel, McKinney feldspar mine.

at an embarrassingly abrupt halt amid the jagged rocks, tantalizingly awaiting below.

Essentially, the minerals to be found here are the following; *Samarskite* (the tantalate-columbate-titanate of iron, calcium, uranium, the cerium and yttrium rare earths, and thorium, all thrown together with a little of practically every element known to man, and perhaps more too). This occurs as glossy, coal-black masses with a sub-conchoidal fracture in the white and pinkish feldspars, predominantly in the latter. The appearance of pure masses of this mineral is very much that of coal. In fact, the writer has, at one time or another, probably picked up every piece of coal laying about the mine, in looking for samarskite. The coal has its origin from some of the earlier equipment used by the miners. One has but to note the light weight of these pieces to distinguish them from the true samarskite. It is a characteristic of this particular occurence of samarskite that it is almost invariably directly associated with columbite, often in such an admixture as to render the two indistinguishable, one from the other. One cannot tell where the samarskite ends, and the columbite begins. It is probably most accurate to label such a specimen as "samarskite-columbite". However, conversely, in some specimens the two are markedly separated, so that it is easily seen where the glossy-black of the samarskite blends in with the dull grey-black of the columbite.

Repeating, when the two species are separated, it is simple to differentiate them, as the samarskite is of a glossy, coal-black color, has a conspicuous sub-conchoidal fracture, and is very radioactive. Contrastingly, the columbite is more of a grey-black color, is of a dull lustre, less radioactive, indistinct fracture, and conspicuously heavier.

Experience has shown that by far the greater number of the best specimens of samarskite, and also the columbite, are to be found in the pinkish and salmon-colored feldspars, rather than in the lighter-colored ones. Hence, one's

Photo 3. Another view of McKinney feldspar mine, Crabtree, Mitchell Co., N.C. (Hyalite and torbernite on upper right ledges.)

efforts can be considerably more rewarding if he focuses his searches towards such colored feldspars. Associated with the samarskite are columbite, chalcopyrite, pyrite, sphalerite, and occasionally some bornite.

Columbite (tantalate-columbate of iron and manganese).

This mineral occurs here as dark grey-black to lead-grey-black masses, with a dull lustre. It has a conspicuously high specific gravity, and often displays a bluish iridescence. Theoretically, it is not radioactive, but from this particular locality, due to admixed samarskite, it more often is than not. While the average specimen consists of a small mass of "spot" of about ½ inch across, specimens weighing several pounds, and in 2 x 3 inch sizes are occasionally found. Some have been recovered in "pure" masses of around 20 pounds.

Monazite (phosphates of the cerium rare earth metals, with some thorium).

This is one of the less common minerals to be found here, but it is of considerable interest. It has also been found in large pieces of about 2-3 pounds. It is of two colors, as found in this locality; brick-red to yellowish. It is also found as masses, some of which occasionally show one or more crystal faces. It has a characteristic resinous lustre, and is conspicuously heavy. As found here, it is always quite radioactive, probably due to a high thorium content. It is almost invariably associated directly with a mineral of a conspicuous coal-black color, most of which occur as veinlets scattered throughout the monazite. The nature of this particular associate is uncertain to the writer, but it is expected that a good portion will probably prove to be allanite, or some chemically related substance. It is suspected that some of this may prove to be gadolinite.

Torbernite (Copper - uranium - phosphate).

Bright chrome-green micaceous masses of this mineral coating the lighter-colored feldspars was once a common specie of this mine. However, it is but rarely encountered at the present. As this is a very delicate mineral, it is very easily "flaked-off" the rock surfaces containing it by any manner of rough handling. It is very readily identified by its characteristic color and micaceous form. As it also contains uranium, it is quite radioactive, though sufficient concentrations to give a very high count are few and far between. The writer would caution the lucky collector who might locate some specimens of this to be very careful in washing them, using only the force of the running water, rather than any brushes. This is essential owing to the delicate nature of the mineral rendering it readily washed off, to be concentrated in nice "lodes" in the sink trap.

Hyalite (hydrous silica).

This variety of opal is found here coating one or more of the surfaces of the pegmatite. As it is deposited from water solutions which permeate the cracks of the pegmatite, it is to be sought as vein filling deposits along these cracks. In color it ranges from colorless to pale blue or green. Often it is of a muddy-red color, due to mud inclusions. This mineral is highly fluorescent under short (2537) wave ultra-violet radiations. The fluorescence is generally held to be due to traces of uranium salts in its composition. This theory is aided by the fact that its color of fluorescence is exactly that of autunite, or a bright yellow-green. The intensity of the fluorescence decreases markedly with an increase in natural color of the specimens, and also with an increase in mud inclusions. This fact is probably due to the absorption of either the ultra-violet or the fluoresceing color by these particular varieties. This is also a very fragile mineral, "flaking-off" very easily, hence it should be cleaned only with the greatest care.

Sphalerite (zinc sulphide).

The occurrence of this mineral in a pegmatite is not at all a common, or orthodox, one. This, together with the fact that these specimens are often radio-

active, due to admixed samarskite, makes this a most unusual specimen. It is found as steel-grey to black masses, often with a bluish iridescence, and which tarnish readily to a bronze-yellow colour. These features, together with its characteristically resinous lustre, serve to distinguish the sphalerite from other species found here.

The fact that this mineral is often quite radioactive once caused it to be a subject of considerable concern, among local collectors. It was quite some time before it was finally recognized to be sphalerite. It is often associated with pyrite, chalcopyrite, and columbite.

Uranophane (calcium uranium silicate).

This is here found as bright sulfury-yellow amorphous coatings on one or two surfaces of the feldspar. As it usually contains small amounts of autunite mixed in with it, these portions are fluorescent under both wave lamps. This is also a very delicate mineral, and nice large pieces are but rarely found on the dumps anymore. It is also quite radioactive, due to its uranium content.

Chalcopyrite (copper sulphide).

Small masses of this, often associated with sphalerite and pyrite, are occasionally to be found here. It occurs as golden-yellow metallic masses often altered in part to the blue azurite, or the green malachite.

Uraninite (oxide of uranium).

This specie is but rarely to be found here, and when it is found, is usually as small spots or "eyes" (2-3-mm across) surrounded by bright yellow uranophane or orange-red gummite. The uraninite itself occurs as black to steel-grey masses. Needless to say, it is quite radioactive.

Beryl (beryllium aluminum silicate).

Masses of beryl of several colors are found here. The color range is from pale yellow, pale green to blue. It is interesting to note that it seems to occur here only in masses, rather than the crystallized form more common elsewhere. It is easily mistaken for massive colored feldspars, and must be carefully scrutinized to determine. The absence of the feldspar cleavages will serve most readily to distinguish it.

THE #20 MINE.

This is another one of the large workable pegmatites of this area, and is located about one mile NNW of the McKinney. It is located on the west side of the west fork of Crabtree creek, just north-west of Murphey Falls. Actually this mine is located in Yancey County, rather than in Mitchell.

The main workings, as they appear today, are shown in the photograph (#4 & 5).

In the wall of the opening to the right (photo #4) have been found nice specimens of cyrtolite, monazite, and thulite. In the rear wall of the opening to the left (photo #5), have been found specimens of gummite, clarkeite, cyrtolite, uranophane, thulite, and allanite.

As with the McKinney Mine, the best place to look for specimens here is on its dumps, and those species to be found here are the following:

Cyrtolite (zirconium, yttrium rare earths, uranium, etc, as silicates?).

This rare mineral occurs here as brown-purple masses of characteristically rosette-like crystals. In this respect they resemble somewhat the "desert-rose" gypsums of the Western States. This specie is usually directly associated with one or more of the following; uraninite, gummite, monazite, thulite, or garnet. It is quite radioactive.

Uraninite (oxide of uranium).

Almost invariably at this locality this is found as small black "eyes" or nuclei in the centers of gummite masses. It is very radioactive, and the specimens so associated with the bright orange-red gummite are very attractive.

Monazite (phosphates of the cerium rare earths, with thorium).

Most often this mineral is found here as masses of a yellowish color, though several wedge-shaped crystals of a reddish color have been found. It is sometimes associated with thulite, and cyrtolite. It is frequently quite radioactive.

Gummite (mixed uranium oxides, etc. Recently discredited as a distinct specie).

Gummite is one of the most showy minerals of this locality, though seldom anything but very small specimens are to be found (about ¼-inch masses). It is deep yellow to orange-red in color with a characteristically "waxy" lustre. It is sometimes associated with clarkeite, and almost invariably with uraninite. It is quite radioactive. It seems to be localized here, close to, or within, the massive garnet. Collectors seeking this mineral would do well to look for those rocks which have masses of garnet in them, looking in this garnet for the "tell-tale" yellowish or reddish gummite.

Clarkeite (mixed uranium oxides, etc).

This is one of the rarest specie to be found here, and only very seldomly is it encountered. It resembles gummite in both texture and lustre, but differs mainly in color. The color of the clarkeite is a chocolate-brown. It is almost invariably found in direct association with the gummite. It is quite radioactive, and one of the most sought minerals of this locality.

Thulite (hydrous magnesium aluminum silicate).

Thulite is one of the more common of the uncommon minerals to be found at this mine. It occurs here as pale to deep pink, finely crystalline coatings on the feldspar surfaces. Occasionally, it is found as clusters of larger crystals, assembling very much those of rubellite tourmaline, both in color and mode of crystallization.

A particularly interesting occurrence of this mineral here, is as inclusions in the greenish muscovite which locally abounds. These crystals are often in small, radiating clusters of a bright pink color cutting across and along the mica cleavages. Some nice specimens have been found here with inclusions of both thulite and the dark-red, flattened garnets. Collectors would do well, when they come upon pieces of this mica, to split them into thin sheets, examining them carefully, between successive splitting, for these inclusions.

Allanite (silicates of the rare earths metals and iron, commonly with some thorium).

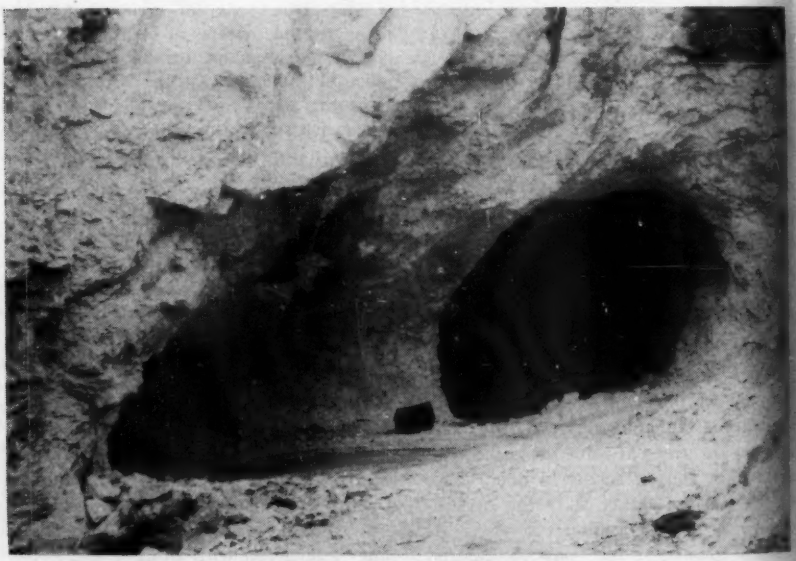


Photo 4. View of #20 Mine, Crabtree, Mitchell Co., N.C.

Allanite is found here as bright velvety black (if unweathered), needle-like crystals usually on the feldspar surfaces, but occasionally extending into the spar. It it sometimes radioactive, due to the presence of thorium, but only weakly so.

Calcite (calcium carbonate).

This common mineral specie is listed here because at this locality it is generally fluorescent. It is to be found as pale-yellow-brown to brown masses in the spar. Only the more pale varieties are conspicuously fluorescent. The color of the fluorescence is a pale orange-red to deep red. It is only fluorescent under short (2537) wave ultra-violet.

Hyalite (hydrous silica).

This is quite common on these dumps, and literally "abounds" along the cracks and crevices in the left wall leading to the entrance of the workings. (This particular wall is not shown in the photograph, but is to the left, and a few feet behind, the visitor looking at photograph #4). Here, it coats, as botryoidal, glassy crusts, some pegmatite slabs which are well over eight-feet long, and 3-4-feet wide. Who wants one for his shelf? It is more commonly of a muddy-red color, though it is also colorless, and several shades of blue and green. It is vividly fluorescent under short (2537)-wave ultra-violet, particularly so with the paler-colored ones.

Directions:

From Burnsville, in Yancey County, North Carolina, take U.S. 19-E, and proceed through Micaville, towards Spruce Pine, to the Yancey-Mitchell County Lines. At this point (see map), there is a small bridge under which flows Crabtree Creek. Directly on the opposite side of the bridge (Mitchell County side) turn sharp right onto Crabtree Road (paved). Proceed up this road for about 3 miles, to the point where the road, which has only been gently climbing, turns sharp left and begins climbing steeply. Exactly at this point, there is a small dirt road which dips down and cuts off to the right of the main road. Take this road and proceed for about 100 yards, at which point it will turn sharply to the right and cross the creek. Park here, and follow the road across the

Photo 5. Another view of #20 Mine, Crabtree, Mitchell Co., N.C.

creek (if you have a jeep you can drive) for about ¾ mile to the #20 Mine.

For the McKinney Mine, return to the main road (Crabtree Road), turn SHARP right, and proceed up for about 1 mile, to the point where the paved road ends, directly beyond a small bridge. Directly before this bridge, turn sharp left and proceed about 100 yards, into the McKinney Mine.

For the Crabtree Emerald Mine (which is now POSTED), proceed on through the McKinney Mine for about 2 miles, where the road forks, with a church on the left, in the center of the forks. Take the left fork, swinging around and behind the church, and proceed for about 1 mile, at which point the road is so "gutted" that one *must* stop and continue on *foot* for the additional 2 miles to the Emerald Mine, (proceeding through a large cow pasture).

THE MASTER ROCK HUNTER

By BEA THOMAS*

He searched the dump with eagle eye, This man I speak about.
He knew what he was looking for, There wasn't any doubt.
He climbs among the rocks and boulders, 'Neath the scorching sun.
He couldn't rest until he'd found, A very special one.
He found a rock, a rough old stone, As ugly as could be,
He turned it over in his hand, It held no charm for me.
He took it down into the stream, And washed it 'till it shone.
And yet, to me, it still remained, A rough and ugly stone.
And then one day I chanced to meet, This friend along the way,
And in his hand he held a group of jewels, on display.
But one stood out from all the rest, None other quite so fair,
It flashed and sparkled in the sun, With colors rich and rare.
Where did you get this lovely stone? I gazed in deepest awe.
"You've seen this stone before," he said, "when it was in the raw.
'Twas quite a job to cut it down and bring its beauty out."
But of the beauty it contained, He'd never had a doubt.
And so he'd worked with loving hand, He'd chipped, sawed and ground,
And polished all its facets, So that not a flaw was found.
" 'Tis quite a miracle," said I, "Now tell me what's it worth?"
"It's priceless," he spoke lovingly, "Worth more than all the earth."
Then later on, there sat a king, sitting on his throne
And on his head, a golden crown, with brightest jewels shone.
And there among the multitude, (Yes, you have guessed my story,)
There gleamed the stone I'd seen before, Majestic in its glory.

• • •

*Mrs. Thomas is the wife of Luther Thomas, Micaville, N.C., a well known veteran mineral and gem collector of the Western North Carolina mountains.

MINERAL RESOURCES OF NORTH CAROLINA

By FRED ALLEN, Lincolnton, N.C.

North Carolina contains a wide variety of mineral resources, with more than 300 kinds of rocks and minerals known to occur in the state.

In the Coastal Plain are found clays, sands and gravels, semi-consolidated sandstones, greensand, phosphate rock, shell limestone, marl, peat and ilmenite sand. The Piedmont Plateau contains clay, shale, slate, granite, gabbro, gneiss, sandstone, barite, sillimanite, kyanite, kaolin, mica, quartz, monazite, pyrophyllite, soapstone and spodumene. Here also are found ores of gold, copper, iron, manganese, chromium, titanium and tungsten.

The chief mineral resources of the Mountain region are feldspar, mica, kaolin and quartz. Minerals associated with peridotite formations include olivine, asbestos, talc and soapstone, vermiculite and chromite. In addition to these, granite, gneiss, quartzite, marble, limestone, talc, sillimanite, kyanite, garnet and ores of iron, manganese, titanium, copper and gold are present.

Visitors to the Eastern Federation of Mineral Societies Show in Asheville August 7, 8, 9, 1958, may be interested in the following list of minerals found during the past year by members of the Southern Appalachian Mineral Society, host to the show:

Beryl, including emerald, aquamarine, golden, clear and opaque.

Quartz, including clear, white, smoky, citrine, amethyst and drusy.

Agate, banded and in numerous colors and various colored chalcedonys.

Mica, including rum, ruby, black, green, fuchsite and vermiculite.

Corundum: ruby, sapphire, pink, amethystine, bronze, black. Stars have been cut from many of these.

Garnets: almandine, pyrope and the famed rhodolite.

Olivine, massive and crystallized, peridot and smaragdite.

Serpentine, picrolite and chrysotile.

Hyalite opal, highly fluorescent, with colors ranging from clear to green and blue.

Apatite, fluorescent, from clear to dark green crystals.

Kyanite, blue and green up to gem quality.

Spodumene crystals, including hiddenite.

Titanium: massive rutile, crystals, reticulated rutile crystals and ilmenite.

Feldspar: white, moonstone, amazonite, pink, peach, mahogany and unakite.

Barite, white to clear and in crystals.

Calcite crystals, some highly fluorescent.

Thulite crystals and as mica inclusions.

Torbernite and all forms of radioactive minerals as listed elsewhere in this issue.

Rare earths: Monazite, cyrtolite, clarkeite, euxenite, allanite.

Columbite and *tantalite*.

Magnetite, hematite, goethite, limonite, pyrite, chalcopyrite, malachite, azurite, bornite, chromite, garnierite, bronzite, psilomelane, sphalerite, zincite, gold, silver, galena, molybdenite, epidote.

Tungsten, scheelite, huebnerite and wolframite.

Fluorite, varied colors.

Limestone, often with fossils.

Marble, varied colors.

Actinolite, tremolite, hornblende, zoisites, siderite, spinel.

Zircons and associated sphene and rare-earth minerals.

Samarskite crystals.

Field trips to many of the localities where these, and other, minerals were found will be made the week following the Eastern Federation Show. These guided trips, sponsored by the Southern Appalachian Mineral Society, will be open to all who register at the show.

"OLD PLANTATION" EMERALD MINE

By DOUGLAS B. STERRETT, Charlottesville, Va.

Douglas B. Sterrett, author of the accompanying article, has been one of the country's outstanding geologists and mineralogists for more than half a century. A graduate of Yale University in Geology under the late Dr. Edward S. Dana, he went with the U.S. Geological Survey in 1906 and gained note for his annual publication of bulletins on "The Production of Precious Stones in the World," issued annually by the government from 1906 to 1914. He served in many capacities with the Survey for many years after this. On several occasions during his career he engaged in commercial mining in Canada and the United States. For the past several years he has served as a Cousulting Geologist to a number of mining interests. Mr. Sterrett now retired, is living in Charlottesville, Va. He is a valued member of the Southern Appalachian Mineral Society.

Emerald localities are rare in the United States though a few of them have been found. The best of these are in North Carolina though none of them have developed into paying propositions. Occasional crystals have been reported in the New England and other states but were too pale colored to be classed as good emeralds.

The first occurrence in North Carolina was reported about 1875 near Stony Point in Alexander County. Prospecting turned up a few good emeralds but these lost their importance beside the more abundant and beautiful dark emerald green spodumene (hiddenite) with which they were associated.

The second locality was found in 1894 on Crabtree Mountain near Spruce Pine in Mitchell County. At this place a peg-

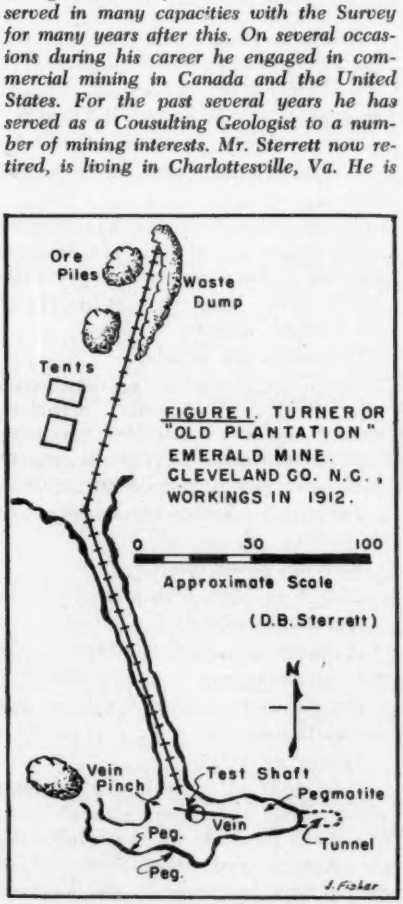


Fig. 1. General layout of main workings at the Turner Emerald Mine.

Fig. 2. Sketch map of region around Turner Emerald Mine with basic rock areas located for possible prospecting.

matite deposit carries good colored emeralds in profusion along the hanging wall. They occur chiefly in small perfect hexagonal crystals with only a few gems of larger size. Associated with quartz, feldspar, biotite and black tourmaline they furnish the unique and lovely "emerald matrix" so appreciated by the collector and amateur lapidary.

The third discovery was a fragment of broken emerald crystal picked up near Earl, Cleveland County, in 1897. Dr. George F. Kunz describes it as having the best color of any seen in North Carolina, resembling the Muzo, Colombia, emeralds. This piece of emerald yielded a cut stone of good color weighing nearly five carats. This was possibly the same find reported to Mr. George L. English at that time as on the Border's farm about a mile east of the later-discovered Turner Mine. Mr. English's effort to locate the Border's deposit at that time was not successful.

Nothing more was heard of emeralds in this region until 1909, when fragments and crystals of emerald, some of deep emerald green color, were picked up in a cotton field on the land of Mr. W. B. Turner, four miles northwest of Earl and nearly five miles southwest of Shelby.

The Turner farm lies along the east side of the First Broad River in a moderately dissected area of the Piedmont Plateau. The elevation is about 680 feet above sea-level. There were no fresh rock outcrops at the surface which had been plowed over many years in farm work, mostly cotton growing. Fragments of emerald crystals were found along with crystals of quartz and black tourmaline and blocks of partly altered country rock in the sandy red clay residual soil on a gently sloping hillside.

The discovery was brought to the attention of Mr. English, who recognized its possible value and arranged for prospecting work with Mr. Turner. A careful search of the surface yielded a few

1. Emerald crystals from Turner or Old Plantation Mine. Large crystal on left was found on the surface in 1909 and the others in the discovery pit.

dozen fragments and etched crystals of emerald from an area of about 100 feet by 25 feet down the hillside sloping to the northwest. Among these was half of a broken crystal measuring three-fourths of an inch wide, half an inch thick and one and an eighth inches long (see crystal on left in Photo 1). It had a deep green color in part clear and in part cloudy with some checks and flaws. It was sold for $100 and helped Mr. Turner and Mr. English decide on further test work.

Early in 1910 a prospect pit six feet deep exposed a pegmatite vein one to two and a half feet thick (see Photo 2. The pegmatite lies between the two prospect picks. Mr. English in center). A handful of good colored and paler emeralds was found in this pit. Three of these are shown on the right in Photo 1. Further work on this vein uncovered a good pocket of emeralds at a depth of 10 feet with a fair proportion of the crystals of gem quality with bright green color.

About this time Mr. Lovat Fraser, of New York, optioned the property for test work with success. Later he enlisted the help of Mr. E. P. Earle, of New York, and together they bought the mine in the spring of 1912. From this time on to the closing in 1913 the deposit was worked under the name of the "Old Plantation" Mine by the Emerald Company of America with Mr. Fraser in charge.

The mine was visted four times by the writer, first after the finding of the emeralds in the cotton field before any test work was done and later between operations unfortunately at times no

2. Turner Emerald Mine. Discovery or first pit made. Six feet deep. Emerald bearing pegmatite between two prospect pits. Mr. English in center.

emeralds were being recovered. None of the field notes made at these times are available, but in the accompanying sketch map (see Figure 1) made from memory, photographs and published notes, an attempt has been made to show the main workings at the time of the last visit in November, 1912.

Mr. Fraser deepened the earlier pits and made various cuts and trenches. The open cut along the "vein" was enlarged and carried to a depth of 25 feet where the emerald "vein" pinched out. A pit or shaft 10 feet deep in the bottom of the open cut failed to find more emeralds or vein material. The emerald vein had a maximum length of 40 feet ranging from 1 to 3 feet thick and varied considerably in the content of emerald crystals from place to place. The open cut was about 75 feet long easterly and westerly with irregular outline and exposed 4 to 5 more pegmatite bodies but emeralds were found only in the one marked "vein".

From the open cut a deep trench was run northerly out to the hillside where waste rock was dumped in the low ground and pegmatite was stacked for sorting. (see photo 3). After the exhaustion of the discovery "Vein" other pits and trenches were made both to the east and to the west of the main pit. These yielded only pale colored beryls but no emeralds.

The regional country rocks are gneisses and schists. In the mine area these are intruded by diorite and other ferromagnesian rocks such as gabbro, and hypersthenite and all later intruded by granite and associated pegmatite. The pegmatites cut the gabbro and hypersthenite at various angles but the majority and the emerald "vein" have an easterly-westerly strike and high dips.

The pegmatite of the emerald "vein" was medium to coarse grained and composed of quartz (both massive and crystallized) and a feldspar, part of which was albite, with black tourmaline and

3. Turner Emerald Mine. North over main open cut and workings, November, 1912. The discovery pit was developed into the open cut in the foreground trench and track run out to dump and ore piles on left.

beryl. There were a few small miarolitic cavities in which the emeralds and other minerals assumed better crystal form. The emeralds had characteristic hexagonal prism shape with flat basal terminations. Many of the emerald crystals were deeply striated and etched, especially on the prism faces. Some had internal striations or tubes extending through their length. Such stones exhibit a cats-eye effect when cut "en cabochon". The albite occurred in rough crystals and aggregates of stout crystals but not in the tabular cleavelandite type common in some gem bearing pegmatites. The quartz crystals were of average perfection and many were of the smoky type.

The presence of pale colored beryl crystals in a number of the pegmatites of the area with only one deposit carrying emeralds and that one cutting the hypersthenite-gabbro basic rocks cause speculation as to the source of the color of the emeralds. These rocks were found to carry 0.17 per cent of chromium oxide. Max Bauer attributes the color of the Colombia emeralds to the presence of the 0.186 percent chromium oxide they were found to carry. These hypersthenite-gabbro rocks were intruded by, and partly absorbed by the inclosing granite and pegmatites. In this process sufficient chromium oxide could have been absorbed and put into circulation at some period to give color to the beryl crystals that were being formed at that time.

The total yield of emeralds was given by Mr. Fraser as about 3000 carats (about 1 and ½rd pounds) of rough crystals from which the writer saw more

4. Turner Emerald Mine. Looking east in main open cut. Mr. English in foreground points to a promising looking but barren pegmatite. Mr. Fraser in background with arm resting on knee.

than 1000 practically perfect small gems and many larger faceted stones that had been cut. Unfortunately the prices received for the gems were not commensurate with their value since Mr. Fraser's partner impatiently sold the lot for a lump sum, not being familiar with the marketing of gem stones. To the writer's knowledge a few stones were sold at better prices. One 2 carat stone went to a dealer for $200 and was turned over within a week for $250. Other gems were seen appraised at $200 per carat. No data is available on the actual number of cut stones sold and prices paid for them but the writer is of the opinion the total output should be placed above $20,000.

A quantity of specimen material was accumulated during the mining but was unfortunately destroyed in a fire at the mine and very little has been available for collections.

The writer has not seen the mine since 1912 and has no information on the present ownership and possibilities of the locality for mineral collectors. The area should be interesting, however, to a careful searcher for other possible emerald occurrences as well as for beryl, quartz crystals and other specimens.

Such prospecting could start with a close search of the surface along a belt of gabbro-hypersthenite-soapstone outcrops extending from one-half mile south-west of the mine on the west side of First Broad River two miles N40 degrees East through and beyond the mine area (see sketch map, figure 2). The larger body of gabbro 1½ miles N 60° E of the mine and two smaller areas to the west and to the east should be included in the area to prospect. It is probable other outcrops of similar rocks will be found in this search and each of these might be a possible emerald area.

Where farming has been abandoned and the land allowed to grow up in weeds, bushes and woods prospecting will be difficult, but where kept in cultivation it will be much easier. It is important to get permission from the landowners before doing any searching.

Nothing has been said of the possibilities of finding more emeralds. This would involve heavy stripping and study of material being removed and of course only undertaken as an interesting gamble. Such work can be done so much more efficiently with present methods and equipment that a considerable area can be quickly tested. Deeper tests at the mine might be considered also, especially if any other emerald bearing veins are uncovered.

Carolina Mineral Museums

The Carolinas offer three public mineral museums which may be visited on the way to or from the Eastern Federation Show in Asheville August 7, 8, 9, 1958.

The North Carolina State Museum is located in Raleigh and has a fine display of North Carolina minerals as well as specimens from other areas.

The North Carolina Mineral Museum, operated by the Federal government, is located at Gillespie Gap on the Blue Ridge Parkway near Spruce Pine. Representative North Carolina minerals are to be found here and there is a study collection for advanced collectors.

Visitors coming up from the South may visit the South Carolina State Museum of Minerals located on the campus of the University of South Carolina in Columbia. This museum houses the largest collection of hiddenite, the world's largest monazite crystal, and a number of other mineral "firsts."

Rare Anatase found near Shelby, N.C.

Fine blue bipyramidal crystals of rare anatase, up to a quarter of an inch in size, have been found at a new location near Shelby in Cleveland County, North Carolina.—Fred Allen, Lincolnton, N.C.

Gemstones of North Carolina

By GEORGE A. BRUCE, International Import Company
604 Peachtree Street, N.E., Atlanta 8, Georgia

"The Land of the Sky" that is North Carolina is also the Land of Gemstones. This beautiful state is highly mineralized and a treasure-trove of many superb gems.

At first the gems were a by-product of other industry. Briefly, their development follows a certain order. They first came to light in the gold-mining era from the early 1800s until the Civil War. Then, for some twenty-five years following, the mica and corundum interests gave further rise to their discovery. With the advent of more serious scientific research, the need for rare earths and monazite sands brought forth still more gems of considerable beauty and value. The fourth step was the systematic mining for the stones themselves. At present a fifth period has begun, that of the discovery of possibly the richest uranium deposits in the eastern United States. This will undoubtedly lead to more important gem discoveries.

The first to initiate the systematic mining of gems in North Carolina was Mr. C. W. Jenks. This was in 1871 when he opened the corundum mine on Corundum Hill, near Franklin, Macon County. The next was the Buck Creek, or Cullakeenee Mine, in Clay County. This was followed by the mining of emeralds at Stony Point, Alexander County. These gem "pioneers" pointed the way and their present-day descendants give every indication that these early efforts will bear much fruit.

Diamonds, not only of pure water, but in tints of green, bright canary yellow, etc., have been found in isolated incidences. The largest was found in 1886, near Dysartville, and weighed 4⅛ carats. The first specimen was discovered in Brindletown Creek, Burke County, by Dr. F. M. Stephenson in 1843. Several other stones were recovered in various counties.

Rubies and *Sapphires* compose the most important gemstones of North Carolina. The rubies vie with the world-renowned stones from Burma in color; however, they usually are not as flawless. One stone has been evaluated at $1,500.00 after cutting. The rubies are located largely in Macon and Transylvania counties and the sapphires in Jackson and Transylvania counties. Of particular importance was the discovery of one of the finest emerald-green sapphires in the world from the Culsagee mine. The crystal is 4x2x1¼ inches and is in the famous Morgan-Bement collection. Star stones are also found and when of a particular bronze luster are referred to as "pearl corundum" locally.

Beryl of several varieties is present, particularly in Alexander County. The emeralds from the Crabtree Mountain mine are the most famous, but only a few of the crystals are transparent enough for faceting; however, they are superb as specimens. Very fine aquamarines in many hues are abundant and rival the finest stones from any country. Often gems as large as 30 carats may be cut. Golden beryls of excellent quality and considerable size have also been recovered in North Carolina. A beautiful deep green beryl weighing 25.4 ounces was found in Alexander County in 1888 and a number of others have since been unearthed. A few rare beryls of an attractive honey-color have been recovered from time to time. Many North Carolina beryls show a cat's-eye effect when cut cabochon.

Hiddenite, a yellowish emerald-green spodumene, was found in Alexander County in about 1879. This was given considerable publicity and a stone weighing 2½ carats was sold for $500.00 in the 1880s; others bought from $40.00 to $100.00 per carat in this same period. Other spodumenes ranging from the rare

colorless stones to various shades of yellow and yellow-green have been discovered. Dr. J. Lawrence Smith, after properly analysing hiddenite as a new gem, named it in honor of Mr. W. E. Hidden; however, its actual discovery was made by Mr. J. Adlai D. Stephenson.

Garnet has probably been the most lucrative gem mined in North Carolina. Many varieties are evident, including almandine (iron-alumina), pyrope (magnesia-alumina), rhodolite (⅔ pyrope and ⅓ almandine) and the rare spessartite (manganese-alumina). The rhodolite is the most important of the North Carolina garnets and is to be found on Mason's Mountain and in the gravels of streams in the surrounding area.

Quartz of fine quality and of many varieties occurs principally in Alexander and Ashe counties. The latter has provided magnificent rock crystal in great masses. The finest example of American lapidary work ever executed was carved from one of these crystals and displayed at the Paris Exposition in 1900. This work together with the cover for the "Adams gold vase" are two of the most valuable art objects in the entire Metropolitan Museum of Art in New York. Amethyst of a hue the equal of any has been found in Alexander County. This county and others have produced excellent specimens of citrine, smoky quartz, aventurine, sagenite (rutilated quartz) and rose quartz also. The latter often exhibits fine opalescence and asteriskism. Hornblende in quartz has been recovered in Alexander, Burke and Iredell counties. Non-crystalline quartz such as chalcedony, chrysoprase and jasper are in considerable abundance.

Opal is scarce, but the hyalite variety occurs in Macon, Madison, Cabarrus, Burke and Clay counties.

Zircon crystals weighing up to 2 ounces, particularly in the brownish shades, occur in several places. These can be seen loose in the soil (decomposed feldspathic rock). Small crystals of every color are found in gold sands, but are always very small.

Rutile, of deep red to black, from Alexander County is as fine as any specimen, regardless of locale. These are modified square prisms and take a wonderful polish.

Octahedrite, a rare gem, occurs principally in the gold sands of Brindletown Creek and on the northern slope of Pilot Mountain. It is identical to rutile except for its crystal formation.

Kyanite, a rare gem closely akin to andalusite, is found in several localities, but the finest comes from Mitchell County. These are seen as isolated crystals and the color is almost the equal of those from St. Gothard, Switzerland. One encounters difficulty in cutting this material since its hardness varies from 5 to 7 on Mohs scale within the same crystal.

Gems of lesser importance in North Carolina, yet which may occasionally prove to be of excellent quality, are epidote, blue crocidolite, tourmaline (usually black), peridot, serpentine, edenite (smaragdite; a variety of hornblende), lazulite, staurolite (both the "fairy crosses" and with areas of red sometimes suitable for faceting), malachite and pearls.

The author wishes to express his sincere appreciation to Mr. and Mrs. Gerald Medd, Fort Shuford Mineral Shop, Arden, North Carolina, for the loan of a number of texts from their extensive library on North Carolina gems and minerals. Mr. and Mrs. Medd have a remarkable collection of North Carolina specimens to which all visitors to the Asheville Show would do well to give their closest attention.

Fluorescent Display To Be Shown

The renowned Owen Hoffman fluorescent display will be a highlight at the Eastern Federation Show in Asheville August 7, 8, 9, 1958 in the Municipal Auditorium.

A short informative lecture on fluorescent minerals will be given each hour by Mr. Hoffman.

HIDDENITE, A NORTH CAROLINA GEM STONE

By FRED M. ALLEN, JR.

President, Southern Appalachian Mineral Society

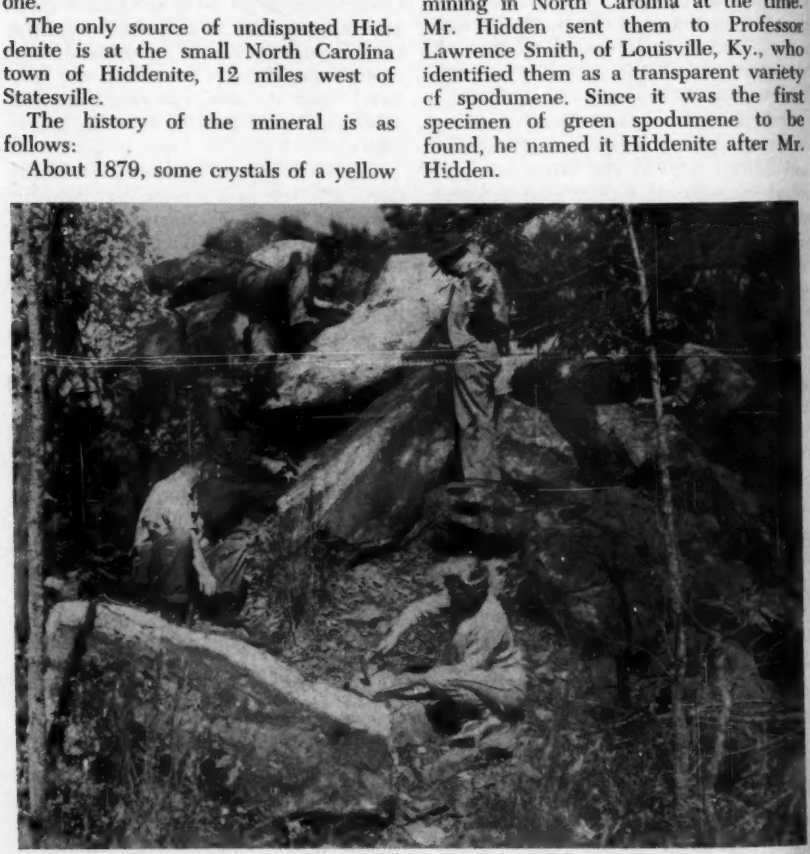
Lincolnton, N.C.

One of the most prized of all gem minerals to a collector is Hiddenite, yet so rare is this emerald-green variety of spodumene that the great majority of collectors have never seen a specimen outside of a museum, much less possess one.

The only source of undisputed Hiddenite is at the small North Carolina town of Hiddenite, 12 miles west of Statesville.

The history of the mineral is as follows:

About 1879, some crystals of a yellow and yellowish-green mineral, supposed to be diopside, were found at what is now Hiddenite. These crystals came into the hands of J. Adlai Stephenson, of Statesville, who showed them to William E. Hidden, noted mineralogist who was mining in North Carolina at the time. Mr. Hidden sent them to Professor Lawrence Smith, of Louisville, Ky., who identified them as a transparent variety of spodumene. Since it was the first specimen of green spodumene to be found, he named it Hiddenite after Mr. Hidden.



This is a portion of the dump at North Carolina's famed hiddenite mine at Hiddenite, a short distance from Statesville. It is within easy driving distance of Asheville, site of the Eastern Federation Mineral Show August 7, 8, 9, 1958. Some of the members of the Southern Appalachian Mineral Society, host to the Show, are shown above on a field trip to the location last fall which produced several of the rare hiddenites. (Photo by Fred Allen.)

The crystals were first found loose in the soil with emeralds. After some further prospecting, Mr. Hidden and others acquired about 300 acres of land and formed the Emerald and Hiddenite Mining Co. in 1881. A deep shaft was sunk and it was found that the crystals generally occurred in cavities. The crystals were all transparent, ranging from colorless (extremely rare), to a light yellow, into yellowish green, then into deep yellow emerald green. Sometimes an entire crystal has a uniform green color but quite often one end is yellow and the other green.

Professor Edward S. Dana, writing of Hiddenite shortly after its discovery, said that, owing to its dichroism, it has a peculiar brilliancy which is wanting in the true emerald.

The Emerald and Hiddenite Mining Co. continued operations until 1888, taking out about $7,500 worth of Hiddenite. About $2,000 more was removed in the preparatory work before the mine opened. A 2½ carat stone was sold for $500, and other stones brought from $40 to $100 a carat. The finest emerald crystal taken from the mine in the early operations was 8½ inches in length. The mine was again opened in 1907 by the American Gem Mining Syndicate and operated two years when it was closed due to property litigation.

In 1926, Burnham S. Colburn, Sr., of Asheville, N.C., and his son leased the mine for two years. Mr. Colburn, who is permanent chairman of the Southern Appalachian Mineral Society, took out about 450 carats of the gem Hiddenite and a number of smaller stones. The finest crystal obtained measured 2⅜ inches by ½ inch by ¾ inch, with one end of a very fine emerald green color which would probably afford a gem of 5½ carats if cut.

Mr. Colburn retains in his collection a number of cut and uncut fine Hiddenite crystals and matrix specimens, but the greater portion of his Hiddenite collection now is owned by the South Carolina State Museum in Columbia.

Throughout most of the past, the Hiddenite property has been "off limits" to collectors. However, just a year ago the present owner, Mrs. Ruby Turner Adams, opened it to collectors on a commercial basis. While many people find nothing, some nice finds have been made.

Also found at the Hiddenite location are rutilated quartz, quartz crystals, dolomite, calcite, pyrites, tourmaline and occasionally emerald. It is impossible to get into the old shafts, now filled with water, and prospecting is limited to a large dump and to surrounding fields which are periodically plowed to provide better hunting.

Specimens of Hiddenite from the Colburn collection will be on display at the Eastern Federation of Mineral Societies Show in Asheville, N.C., August 7, 8, 9, 1958.

XENOTIME-MONAZITE SAND FROM NORTH CAROLINA

Brindletown, Burke Co., N.C.
April 13th 1890

Dear Mack:

Have made a discovery this week. This discovery is of a xenotime-monazite sand and from a deposit that seems to me should yield 5 to 10 tons readily. Already I have ordered 100 lbs. and can get a ton or more at 7¢ per lb., f.o.b. on cars at Glen Alpine Station. I enclose a shifting of the sand which includes the largest grains. It can be had in practically C.P. condition of purity (better than sample).

W. E. Hidden

The above sample was donated to the Editor of R&M by James H. Mackintosh of Peekskill, N.Y. (See Meteorite from Castalia, N.C. in this issue). The sample came from Gum Branch in McDowell County, N.C., about 6 miles from Brindletown. It is a medium grained lustrous brown sand consisting chiefly of brown, translucent monazite and a smaller amount of brown, prismatic xenotime with tiny amounts of reddish, gemmy garnet, black magnetite, and colorless zircon that fl. orange.

"Collected by William Earl Hidden, April 1890,"—on label.

PYROPHYLLITE IN CENTRAL NORTH CAROLINA

By JOHN HANAHAN
Department of Geology, Belmont Abbey College, N.C.

One of the more interesting mineral collecting localities in the State of North Carolina is located in and around Randolph, Moore, Chatham, Alamance, and Montgomery Counties on the eastern edge of the Piedmont in the central part of the state. In these counties pyrophyllite, a white to pale green, soft, talc-like mineral, has been mined for a number of years. Pyrophyllite is used commercially in ceramics, paints, refractories, rubber, insulation, paper, textiles and roofing,

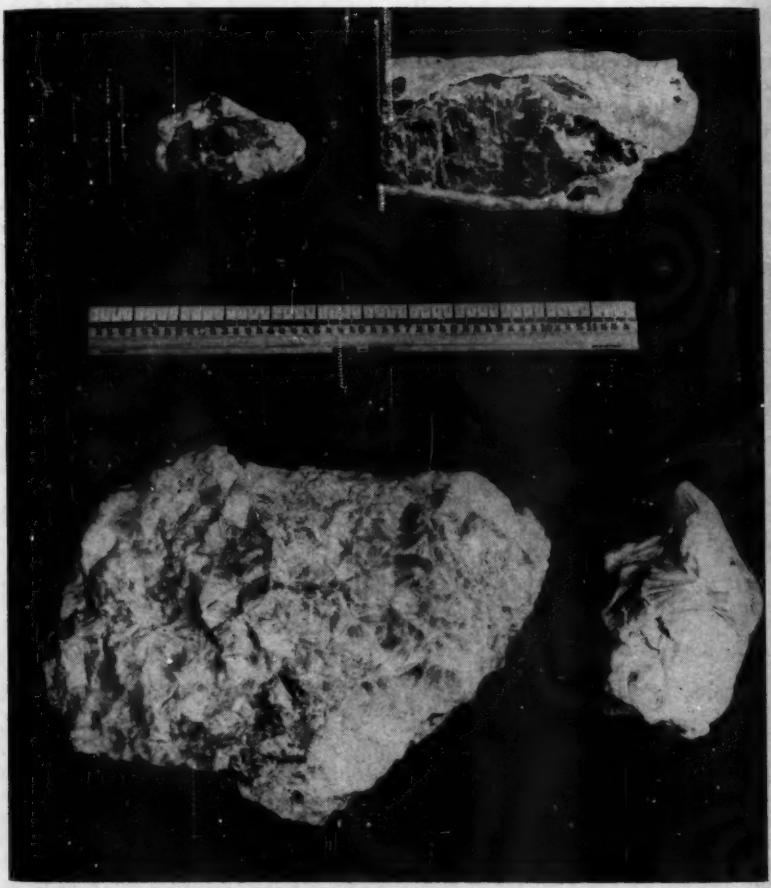


Fig. 1
Top left specimen: lazulite xls in quartz.
Top right specimen: massive lazulite and sericite in typical "sandwich" between layers of sericite schist. Polished face showing.
Lower specimens: typical radiating pyrophyllite crystals.
All specimens from the mine near Staley, N.C.

and, therefore, is in considerable demand.

In North Carolina pyrophyllite is found in lenses within bodies of acid volcanic tuff of pre-Cambrian or Ordovician Age, and appears to represent areas of the tuff altered or replaced through hydrothermal action. Size of the larger deposits varies from 100 to 500 feet in width and from 1000 to 2000 feet in length. Practically all the mines are of the open-pit variety and are accessible to the collector on off-days and after working hours.

The sequence of events involved in the creation of these bodies:

1. silicification of the volcanic tuffs and breccias,
2. pyritization of the silicified areas,
3. replacement of some of the silicified areas by pyrophyllite,

has produced many minerals of interest

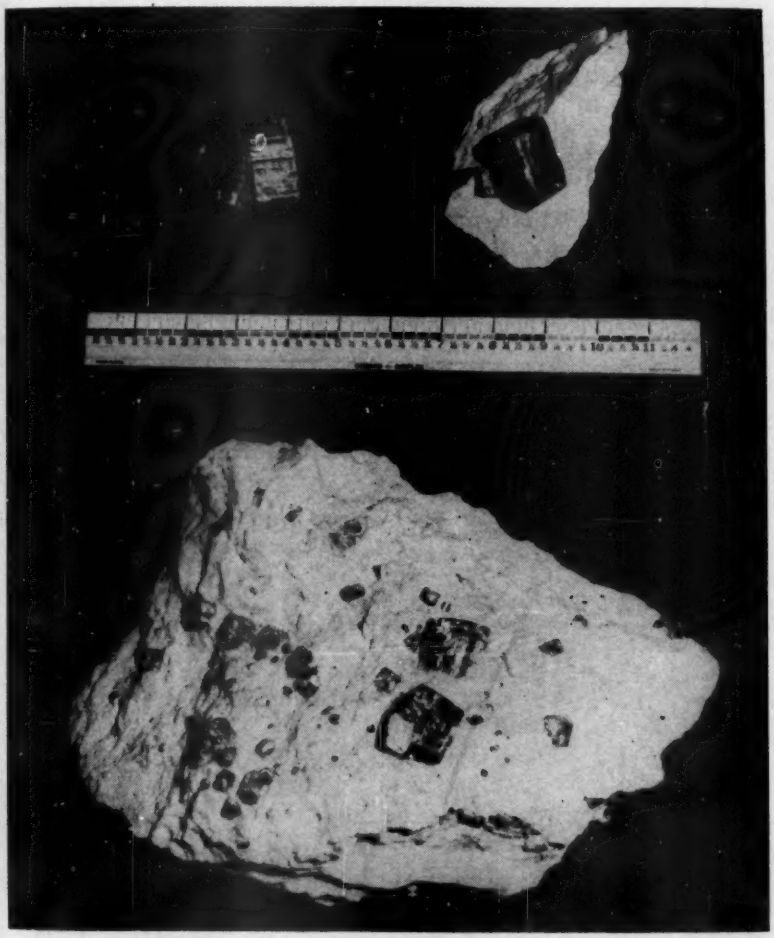


Fig. 2
Upper left: group of two large pyrite xls showing striations.
Upper right and lower: pyrite crystals in pyrophyllite.
All specimens from the mine near Staley, N.C.

to the collector. The pyrophyllite itself usually occurs as a dense foliated mass varying in color from white to green and iron-stained brown. Occasionally seams of very fine radiating crystals are exposed during mining operations, and small vugs in this material may contain rare pyrophyllite crystal terminations. Such specimens are unusual and quite desirable. In the past, dumps at the mine have produced bluish-green radiating crystal masses, probably due to the presence of copper compounds.

One of the most spectacular and unusual mineral occurrences is lazulite, $RAl_2(OH)_2P_2O_8$, a mineral ordinarily considered quite rare, but one which is found frequently at the mine near Staley in Randolph County. Well-formed crystals sometimes appear in association with quartz, but the mineral usually occurs disseminated through small areas in the pyrophyllite, imparting to that area its characteristic bright blue color. Occasionally pure massive lazulite is found with small platy green sericite crystals sandwiched between layers of pyrophyllite. Material suitable for cabochon work has been obtained from such occurrences.

Quartz in the form of crystals and blebs and stringers may also be found within the pyrophyllite lenses. Tufts of radiating pyrophyllite crystals sometimes occur within quartz crystals in the area and form interesting additions to collections of quartz inclusions.

Pyrite crystals of worthwhile size can usually be located on the dumps. Cubic forms are most common and single crystals as large as 3″x3″ have occasionally been found. The mine at Glendon has recently produced fine elongated cubic crystals (unstriated) in massive foliated pyrophyllite.

For the collector of micromounts and advanced collectors of any type, a group of smaller associated crystalline minerals might be mentioned. Small red tabular rutile crystals are found in stringers and vugs within the pyrophyllite bodies, usually associated with quartz. Sphene, sericite, chloritoid, epidote, zircon, and apatite have also been identified in the mineral assemblage typical of this area, and the writer has in his possession several specimens of an as yet unidentified zeolite.

Collecting in the area is, as usual, a matter of obtaining permission to visit the mines or processing dumps and of careful planning of sites, which are scattered over a rather wide area. In the past, Mr. Frank Letterman of Route #1, Staley, N.C., has served the writer as guide to the general area on several occasions and is acquainted with other local mineral occurrences.

Source:

Jasper L. Stuckey, North Carolina Department of Conservation and Development, Bulletin #37, *The Pyrophyllite Deposits of North Carolina*: Raleigh, 1928.

Mineral Facts & Problems, Bulletin 556, Bureau of Mines, 1956.

Make Room Reservations Now

The Accommodations Committee of the Eastern Federation Show, to be held in Asheville, N.C. August 7-8-9, 1958 urges all who are planning to attend to make hotel, motel or room reservations immediately.

There are thousands of accommodations in and around Asheville, but August also is the peak busy season in this outstanding vacation area.

Lists of accommodations are available from the Asheville Chamber of Commerce. There also are numerous trailer courts in and near Asheville, and camping facilities are available in the nearby National Forests and Parks.

The "First" Lapidarist At Show

The Indians were truly the first rock cutters in this country and so they will be represented at the Eastern Federation Show in Asheville, N.C.

Chief Tom Jasper, a full-blooded Indian from the nearby Cherokee Indian Reservation, will be on hand at the Show showing the almost-lost art of making arrowheads from native North Carolina stones.

THE 100 COUNTIES OF NORTH CAROLINA

C. HENRY KING, FRANKLINVILLE, N.C.

ALAMANCE—The North State pyrophyllite mine is located near Snow Camp. Locally the mineral is known as Fire Stone. Although massive, occasional radiated specimens are found.

ALEXANDER—Emeralds were first discovered about 1875 near Stony Point; a few years later the fabulous hiddenite crystals were found at what is now the town of the same name. This area is now opened to collectors for a fee. Bronzite, tourmaline, quartz xls, and rutile found here.

ALLEGHANY—The Crouse manganese mine near Sparta has produced an interesting suite of minerals: galaxite, magnetite, alleghanyite, rhodonite, spessartite, quartz, calcite, and tephroite.

ANSON—About two miles SW of Wadesboro, there is a small patch of crystalline rocks lying on the south side of the Triassic sandstone belt, which is gold-bearing.

ASHE—Site of the Ore Knob copper mine in the eastern part of the county has produced chalcocite, bornite, pyrite, pyrrhotite, magnetite, and sphalerite.

AVERY—About ¼ mile west of Frank Postoffice are many small open cuts. It is reported that asbestus and vermiculite were mined here; minerals not identified.

BEAUFORT—Commercial deposits of collophane and phosphate sand are here. Driller's log for town of Washington shows material of four ages: Pleistocene, Miocene, Eocene, and Cretaceous. Some of the material was limestone, shellrock, blue clay, white and black sands.

BERTIE—A mound was reported on the bluffs of the Chowan River. Apparently a natural prominence, but shell and ash deposits were noted by investigators. Archaeological possibilities.

BLADEN—Well core samples from near Elizebethtown show sands and clay of the Pleistocene; black clay, sand and peat of the Cretaceous. (Black Creek Formation.)

BRUNSWICK—Fossilized mastodon and mammoth remains have been noted here. On Smith Island are shell mounds that may be worth investigating for stones used by the Indians.

BUNCOMBE—Chromite was formerly mined at Holcombe Branch; nickel ores noted at Democrat and Leicester. Corundum, as blue and white xls of good color, but badly flawed, occurs in a massive blue kyanite matrix about 2 miles N.E. of Black Mountain.

BURKE—Three diamonds have been found in this county. One specimen is at the State Museum in Raleigh. It is still in the rough. Gold has been panned in many of the creeks here and platinum grains are occasionally encountered in this manner. Native antimony found in a small vein has been reported in a state bulletin.

CABARRUS—Some of the largest nuggets of gold ever found were discovered here. In 1799 a 17 lb. nugget was found in the Reed mine. In 1803 a 28 lb. nugget was found in this same mine! This area has, in recent years, been declared rich in tungsten deposits. This survey reveals tungsten, barite, magnetite, pyrite, manganese, cuprite, and malachite.

CALDWELL—The Cabin Vein of the Baker gold mine, located near the river on the western slopes of Davis Mt., has galena which carries silver as well as gold. Almandite garnets reported from this county.

CAMDEN—The Pamlico Formation characterizes this coastal plain county. Shell beds are occasionally encountered. Sand

collectors might do well around the sound.

CARTERET—Well logs show: Pleistocene sand, Pleistocene-Croatan sand, Miocene-Duplin marl, and Miocene-Trent marl. Fossil mammoth bones reported from this area.

CASWELL—Iron and manganese minerals are reported from the vicinity of Prospect Hill.

CATAWBA—Four and one-half miles south of east from the town of Catawba on the Southern Railway is located the old Shuford gold mine. This area is of interest because the surface quartz is gold bearing and even some of the soil was found to be auriferous.

CHATHAM—Volcanic breccia and tuff are common in deposits here. Some of the necks of the old volcanoes can still be seen standing well above the surrounding country. A fossil jawbone of Dromatherium (Triassic mammal) was found in this area.

CHEROKEE—Gold, silver, galena, and staurolite xls have been found between Valleytown and Vengeance Creek. Large deposits of manganese and limonite are recorded in bulletins for this area.

CHOWAN—Kitchen middens are reported on the east bluffs of the Chowan River. At Indian sites like these, rocks and mineral specimens are found in the form of artifacts.

CLAY—Nickel ore (mineral not identified) has been on record from Little Buck Creek. Much corundum is found in this county, usually associated with the large peridotite masses. The N.E. slope of Chunky Gal Mountain is typical.

CLEVELAND—Tin ore (cassiterite nodules) was discovered near King's Mt. in 1883. Mining has been carried on intermittently over a period of years. Some extensive manganese deposits are in this region.

COLUMBUS—Well log reports from near Tabor City: Cretaceous, Pee-dee formation—blue marl, white sand; Black Creek formation: blue rock, fine sand, clay and marl, blue clay, and blue sand; Tuscaloosa formation: white clay, blue clay, and sand.

CRAVEN—Fossil mastodon bones have been found at Fort Barnwell. Well core reports show: sand rock, shells (chiefly pelecypods), sandy clay and pyrite, white to pink angular sand, limestone (fossiliferous), and pyritic shale.

CUMBERLAND—An archaeological bulletin reports an Indian site near the road between Pine View and Spout Springs. Stone objects found at such places make interesting specimens. Indians used many stones for ornamental purposes.

CURRITUCK—Fulgurites are likely to be found among the more recent sand dunes characteristic of many parts of the county. Beds of shell marl are not uncommon.

DARE—Among the sand dunes near Nag's Head have been found very fine specimens of fulgurites. These are the result of lightning fusing the sand, usually about a rootlet. Very fragile.

DAVIDSON—Located in the Carolina Slate Belt, this was one of the most important gold areas in the state. The principal mines were known as the Emmons, Cid, Silver Hill, Silver Valley, Conrad Hill, and Welborn. State Bulletin #22 covers this area thoroughly.

DAVIE—Orbicular Diorite is found on the Hairston plantation, one mile west of Oaks Ferry on the Yadkin River. This makes an attractive ornamental stone when the face is polished. It is essentially white feldspar with spherules of radiating dark green hornblende.

DUPLIN—Fossil mastodon bones have been reported. Marl pits are known near Natural Wells (west of Magnolia) also

four miles south of Warsaw. The marl contains Bryozoa and Echinoids.

DURHAM—Triassic shales from this area have been used extensively in the manufacture of brick. Quartz minerals are common. Granite is mined for concrete aggregate.

EDGECOMBE—Fossil mastodon bones are on record for this county. Sands and loams characterize the area.

FORSYTH—Weathered garnets are reported in road cuts on Highway 421 about one mile (from city limits) east of Winston-Salem.

FRANKLIN—The Portis Gold Mine is located just south of Ransom's bridge in the northeast corner of the county about 18 miles east of Louisburg. It was at this mine that two diamonds were found incidental to washing the gravels. Amethyst xls have been reported from near Louisburg.

GASTON—The Catawba gold mine, located one and a half miles south of King's Mt. Station, had an ore body of limestone which was charged with a small proportion of galena and the rare lead telluride, altaite.

GATES—Shell marls of the Yorktown Formation outcrops along the Chowan River.

GRAHAM—An old copper mine is located on a branch of Hazel Creek near Fontana.

GRANVILLE—Two miles from Stem on Bowling Mt. is a pyrophyllite deposit of considerable extent. Throughout the county one may find prospect pits where quartz veins are exposed. These veins carried chalcocite (gray copper) and bornite; rarely native copper.

GREENE—One meteorite on record from here. Driller's log for town of Snow Hill shows Cretaceous (Tuscaloosa? formation); fine gray sand, blue clay, fine brown sand, and hard clay.

GUILFORD—The old Hodges Hill gold mine located about six miles southeast of Greensboro produced quartz, pyrite, gold, siderite, chalcopyrite, and limonite. The chalcopyrite was at times altered to malachite.

HALIFAX—The most famous fossil whale in N.C. came to be known as the Old Bone Foot Log. This was the complete backbone of a large whale that served as a walkway across Fishing Creek, between Nash and Halifax counties, about 2 miles north of Whitakers. Eventually the "log" gave way and the pieces lost in the creek. Some mineral reports refer to deposits of molybdenum in this county.

HARNETT—Iron prospects in this county have revealed specular hematite and the manganese mineral pyrolusite. Near Myatts Mill an Indian village site is reported. These sites have sometimes rewarded collectors with unusual specimens that came from other areas.

HAYWOOD—Near Waynesville is the Big Ridge mica mine, said to be the second largest in the world. Biotite (?) was first found here in 1869 in a woodchuck hole. It is said this gave impetus to mica mining and the groundhog burrow gave way to a 3,000 ft. hole!

HENDERSON—Pyrite and galena are found among the ores of the Boylston gold mine which is located on the southeastern slope of Forge Mt., on Boylston Creek, 12 miles west of Hendersonville.

HERTFORD—Driller's log for Winton: Miocene, Yorktown formation; mud, gray sand. Cretaceous: gray sand, gray mud, white clay. Log for Ahoskie: Pleistocene sand, Miocene, Yorktown marl, sand, and clay. Cretaceous; sand and marl.

HOKE—Extensive sand and gravel pits are being worked in this area. Minerals not identified.

HYDE—This county is crossed by the intracoastal waterway; some of the cuts

reveal shell marls. Some geologists believe that the basin of Lake Mattmuskeet was created by an immense meteorite.

IREDELL—One-half mile south of New Hope Post Office and extending to Rocky Creek is a sillimanite deposit known as the Fox's Orchard Area. The mineral is in nodules in quartz gneiss. Also fine grained interlocking needles associated with large garnets. Most garnets are replaced by sillimanite. Sericite is an associate mineral.

JACKSON—The Cullowhee copper mine at Cullowhee has produced some interesting minerals: pyrite, pyrrhotite, sphalerite, chalcopyrite, azurite, malachite, cuprite, bornite, and covellite. Chromite is found at Dark Creek and at Webster. Sapphires have been found at the town of the same name.

JOHNSTON—Kyanite and pyrophyllite are found among the old iron prospects here. Indian artifacts and fossils are reported near the town of Archers Lodge. Worth investigating.

JONES—Limestone was mined near Scott's Creek. Fossil mastodon bones reported. Driller's log for Polloksville: Pleistocene sand, Miocene-Trent marl, Eocene-Castle Hayne marl, Cretaceous—blue sandy clay.

LEE—West and northwest of Sanford is the Deep River coal field. The coal beds occur in sandstones and shales of Triassic age.

LENOIR—Driller's log for 4.5 miles north of Kinston: Pleistocene-clay, Cretaceous-Peedee formation: glauconitic sand, Cretaceous: Back Creek formation—black clay, micaceous clay, large pyrite nodule; gray sand and arkosic sandstone.

LINCOLN—One diamond found in this county. Cassiterite nodules are found in stream gravels. Nice chalcopyrite specimens have been seen from near Flay. The Graham gold mine is situated about 4 miles N.E. of Iron Station. The ore contains a great percentage of copper.

MCDOWELL—Three diamonds have been found in this county. The largest of the 13 diamonds found in N.C., which weighed four and one-third carats, was discovered at Dysortsville. Another weighed two and three-eighths carats. There is a deposit of graphite near Graphitesville.

MACON—Near the Ellijay Post Office is the Mincey corundum mine. Here was found bronze colored corundum locally called Pearl corundum. Sapphire also found. Vermiculite, talc, and anthophyllite are associated. The rare garnet, rhodolite, is found in this county.

MADISON—In the western part of the county there are small manganese deposits of the limestone-quartzite type. Small pits along side of the Upper Shut-In Creek road show masses of manganite and disseminated pyrolusite in limestone soil. Talc and limonite deposits are of importance in this region.

MARTIN—Driller's log for Williamston: Miocene, Yorktown formation: sand, clay, turritella shell, Eocene: calcareous and glauconitic clay, fossil shells, and lignitized wood. Cretaceous: blue, yellow, and red quartz grains; arkosic sandstone.

MECKLENBURG—Two diamonds found here. One black diamond found in Todd's Branch by gold washers. Many famous gold mines—among them the Surface Hill mine (Clear Creek Township) which yielded several thousand pennyweights in nuggets from just a few square feet.

MITCHELL—Two aquamarine mines were formerly operated in the Grassy Creek section. World-famous McKinney Spar Mine located near Little Switzerland. At Gillespie Gap is the Museum of North Carolina Minerals. Here is displayed specimens which exemplify why the state is called "Nature's Sample Case."

MONTGOMERY—Well known for its gold mines, especially the Sam Christian

mine, located about 12 miles east of Albemarle. This mine yielded remarkably large and fine nuggets. Forty were found which gave the total weight of 4,200 pennyweights. In the Pekin-Mt. Gilead section are found quartz spherulites which are shell-like in appearance; so much so that Emmons (pre-1850) thought them fossils and named them Paleotrochis Major and Paleotrochis Minor.

MOORE—Pyrophyllite is mined at Robbins. This was discovered incidental to mining for gold. There are nine unoperated gold mines in the county. Silicified wood is widely encountered. The Deep River coal field extends into this area.

NASH—One meteorite is on record from here. The Mann-Arrington gold mine is located near Argo, five miles to the southeast of Ransom's Bridge. The gold was carried in quartz veins which included particles of chlorite. Other mines are here. Fossil mammoth bones found in this county.

NEW HANOVER—Coquina is exposed along Highway 421 between Carolina Beach and Wilmington. The Castle Hayne type locality (limestone) is the old abandoned quarry 8 miles north of Wilmington.

NORTHAMPTON—Driller's log for Woodland: Pleistocene-Wicomico formation: clay and yellow sand. Miocene-Yorktown formation: blue clay. Cretaceous: red clay, gray sand.

ONSLOW—An almost complete skull, eight molars, two tusks, major leg bones and other parts of a fossilized mastodon were recovered from this county and are assembled at the State Museum. Almost all drill cores from this county show fossiliferous sands. Extensive limestone mining was done at Belgrade during WW II.

ORANGE—Silicified wood is found abundantly just to the northeast of Chapel Hill. It is locally called the "fossil forest." Near Hillsboro radiated pyrophyllite associated with quartz is found exposed in road cuts. Andalusite is found associated with pyrophyllite in this same area. The old Robeson gold mine is 12 miles N.W. of Chapel Hill.

PAMLICO—There are large and small mounds (Indian?) on Broad Creek and its tributary, Gideons Creek, near Oriental. Mammoth bones and shell marl reported in this county.

PASQUOTANK—Well cores from this coastal plain county show upper Miocene mollusks and Foraminifera underlain by sandstone cemented by iron.

PENDER—Castle Hayne marl common. An Indian site is reported on Rock Fish Creek near Wallace. Fossil mammoth bones in this county.

PERQUIMANS—This county fronts on Albemarle Sound and should afford samples of the ilmenite sands reported for that area. Shell marls are along western edge.

PERSON—In the northeastern area of the county near the Granville line is the Dirgy copper mine. In this vicinity is also the Cross Cut, and other copper mines. The principal ores were bornite and chalcocite, rarely native copper.

PITT—One meteorite is on record from here. Fossilized mastodon bones are reported from this county. Driller's log for Farmville: Pleistocene sand, Miocene (Yorktown) blue clay, Cretaceous sand, clay and marl. Basement rocks: granite.

POLK—Placer mining for gold has been done at the Double Branch, Red Spring, Splawn, and Smith mines. An Indian peace pipe found near the foot of White Oak Mt. by road construction crew was reported to be of "blue stone."

RANDOLPH—Three minerals not previously listed for the pyrophyllite mine (4 miles west of Staley) are massive barite, massive lazulite, and titanite. The titan-

ite occurs as very sharp little xls. This county has numerous monadnocks, the roots of the Uwharrie Mts. Geologists believe these to be among the oldest mountains in the world.

RICHMOND—Pyrite nodules have been found among stream gravels. Petrified wood is widely encountered in this area.

ROBESON—Pleistocene sands characterize this area. Indian burials are reported near Red Springs. The vicinity should be rich in artifacts and stone objects used by the Redman.

ROCKINGHAM—Local collectors report that autunite has been collected from among the iron and mica prospects in this county.

ROWAN—There are huge deposits of milky quartz in the southeastern section of the county. The Dunns Mountain gold mine is located three and one-half miles east of Salisbury. Associate minerals were pyrite and chalcopyrite. Other mines here.

RUTHERFORD—One diamond has been found and platinum grains are encountered in gold washings. Several mines in vicinity of Rutherfordton. There is an exposure of sillimanite schist along Highway 221-A, north of railway, near Cliffside.

SAMPSON—Driller's log for town of Clinton: Pleistocene clay, Cretaceous (Black Creek formation) blue clay, fine sand, brown clay. Tuscaloosa: "pipe clay", and sand.

SCOTLAND—Fragments of brown and green mica schist at 363-445 feet on Driller's log for 3 miles NW of Maxton. Also Pleistocene clay, Cretaceous (Tuscaloosa) micaceous sand, brown clay. Basement rock: pre-cambrian.

STANLY—Fabulous gold nuggets have been found as follows: The Crawford mine is 4 miles east of Albemarle. In the placer gravels two particularly large nuggets were found. One weighed 8 lbs. and 5 oz. and the other weighed 10 lbs. The Parker mine at New London had very coarse gold—a great number of nuggets were found the largest of which weighed 8 lbs, 3 oz. and 2 dwts. In 1935 many nuggests were encountered which weighed from 1 to 2½ lbs. each!

STOKES—Flexible sandstone is found at Gap. The Triassic shales of this area are used in the manufacture of brick. Hanging Rock State Park is near Danbury.

SURRY—The huge granite quarry of the North Carolina Granite Company is about one mile east of Mt. Airy. About 12 miles west of Mt. Airy there are open pits and shafts that were developed for manganese. The openings are in quartzite and mica schist. Here pyrolusite is mixed with quartz, both crystalline and cherty.

SWAIN—The Adams copper mine is located 2 and ½ miles north of Proctor on Gold Mine Creek. Among the minerals are chalcopyrite, pyrrhotite, and a great percentage of sphalerite. Important talc deposits are in this county.

TRANSYLVANIA—Sapphires have been found at Montvale. An important gold bearing locality is in Fairfield Valley on Georgetown Creek. Much gold has been recovered from the gravels in and along the stream. Six to ten miles Northeast of Brevard are pits and small mines where manganese ores were recovered.

TYRRELL—The shoreline of this county is on Albemarle Sound and the beaches here should afford samples of ilmenite and other interesting sands.

UNION—The Long gold mine is 15 miles north of Monroe, Here quartz schist carried pyrite, gold, galena, sphalerite, chalcopyrite, calcite, and siderite. The Moore mine is 3 miles SE of the Long. The minerals are similar.

VANCE—Wolframite is mined on the

property of the Tungsten Mining Corp. about 18 miles north of Henderson. Purple and green fluorite xls are said to be found on the dumps here.

WAKE—Muscovite and orange feldspar is reported in the Wake Forest area. About 3 miles east of Zebulon is a manganese deposit of the spessartite type. The State Museum at Raleigh is in this county; many outstanding specimens of the state's minerals on display.

WARREN—Amethyst, smoky quartz, and beryl are said to be found on farms near Inez.

WASHINGTON—Ilmenite and other interesting sands should be available from this Albemarle Sound county.

WATAUGA—Near the mouth of Squirrel Creek and on the western slopes of Rich Mountain are important chrysotile deposits. On Howard's Creek and also on Harding's Creek one mile north of Boone are found gold-bearing gravels.

WAYNE—15 miles SE of Goldsboro off N. C. Highway #111 and almost equidistant between Kinston and Mt. Olive is The Cliffs Of The Neuse State Park. The cliffs date from the limestone age and their presence is an enigma to geologists. Interesting strata exposed of varied colored sands and gravels.

WILKES—Deposits of chrysotile are reported. Manganese ores were recovered at one time from near Wilkesboro. Rendevous State Park located in this county. Beryl and mica workings reported.

WILSON—One meteorite on record from here. Amethyst has been reported. Many fragments of fossil whalebone were uncovered in a disposal pit at Stantonsburg. Fossil mammoth bones reported.

YADKIN—The Dixon gold mine is eight miles southeast of Yadkinville. The country rock is a weathered mica (sometimes chloritic) schist. Diabase dikes are common. The gold was recovered from quartz veins.

YANCEY—Platinum grains have been recovered from near Burnsville. Near Pleasant Grove Church is a site from which nickel ore was recovered. Chromite was once mined at Mine Fork of Jacks Creek. Amazonite is found at the Ray mine near Burnsville.

In listing minerals and localities for North Carolina the author sought to avoid the more well known mines and minerals for which the state is well known. By deliberately choosing to represent every area it was necessary to fill in that portion of the state which is coastal plain (roughly 50 per cent) and a great deal of the piedmont. This great section has heretofore been neglected in the literature and it was felt that some original work here might encourage the search for other localities.

Although gemstones have been minimized and common minerals been given more prominence, gold, to the contrary, has been highlighted in deference to the increasing number of collectors who now "pan for sport" regardless of their major interest. It was thought desirable to include geological features, sands, fossils, artifacts, and perimeter items because of the growing interest in those related fields.

A work of this sort is almost always a composite of notes from many sources. Though it is believed that this is the first time that localities have been listed for every county in North Carolina, it is to be understood that this is a compilation. After exhausting personal notes it was necessary to do research among other writings. Notable among sources were the pamphlets and bulletins of the Division of Mineral Resources (N.C.) from which the writer borrowed freely. Information sheets from the N. C. State Museum were helpful; Mr. Harry T. Davis, the director, was kind enough to advise of meteorite falls. Mr. Marvin Jackson, of Greenboro, gave some missing notes on piedmont localities. To all those whose writings indirectly contributed to this manuscript, the author is grateful.

GEOLOGY OF NORTH CAROLINA

By FRED ALLEN, Lincolnton, N.C.

Those attending the Eastern Federation of Mineral Societies Show in Asheville, N.C., August 7, 8, 9, 1958, may be interested in a brief and general geological history of the state. The violent actions and great metamorphism which took place thousands of years ago resulted in an unusual concentration of minerals, or a veritable treasure chest for the gem and mineral collector.

The western region of North Carolina is, in general, underlain with gneisses, schists, slates and metamorphosed volcanics into which have been intruded at many places minor masses of basic igneous rocks such as peridotite and dunite and important amounts of normal igneous rocks such as granite, syenite and diorite.

The present distribution of rock formations at the surface in North Carolina is related to the geological history of the state. During the long pre-Cambrian time sediments were laid down, volcanic fragmental and flow materials accumulated, and igneous rocks were intruded. This was followed by a long period of folding, faulting and metamorphism which changed the rocks into gneisses, schists, slates, quartzites and marbles. Also there developed a long narrow trough where the present Appalachian mountains now stand.

During Paleozoic times there was a weathering, erosion and deposition of sediments in the western trough. At the end of Paleozoic time the Appalachian Mountains were formed by uplift and folding of the materials which had accumulated in the western trough. Large masses of granite, diorite and other igneous rocks were intruded into the Piedmont Plateau and Appalachian Mountains at this time.

During Mesozoic time the Appalachian Mountains and much of the Piedmont Plateau underwent erosion. During the Triassic period two long narrow areas of sedimentary red beds were formed in the Piedmont Plateau. During the Cretaceous period the eastern part of the state was lowered and the ocean coast line was established along the western edge of the present Coastal Plain. By the end of Mesozoic time the Appalachian Mountains were reduced to a monotonous plain on which slow-flowing streams meandered in broad flat valleys with little regard for the underlying rock structures. The only noticeable relief was along the site of the present Unaka and Great Smoky mountains where a chain of residual hills stood, similar to the present Kings Mountain range between Gastonia and Shelby.

Early in Cenozoic time the present Appalachian region was greatly elevated without further folding. This caused streams to flow with increased velocity and greater erosive power. The present Appalachian mountains are therefore almost wholly the work of erosion in Cenezoic time.

SOURCE: "Geology and Mineral Resources of North Carolina," by Jasper L. Stuckey and Warren G. Steel.

PLEASE ASK PERMISSION, SAYS SOCIETY

The Southern Appalachian Mineral Society, host to the Eastern Federation Show in Asheville, N.C., August 7, 8, 9, expect a record attendance of rockhunters from all over the country. We welcome them and will do all possible to make the trip a memorable one. We ask one favor in return. Please do not go into mineral locations—even though they look abandoned—without property owners' permission unless on a guided trip with the Society. The Society enjoys a fine reputation for following this rule. Please do not endanger this reputation, and probable court procedures to yourself, by violating this request.

Otis Lugar, SAMS
Field Trip Chairman

LEGEND

- **QUATERNARY** — Unconsolidated Sands and Clays
- **TERTIARY** — Clays, Sands and Marls
- **CRETACEOUS** — Sands, Clays and Marls
- **TRIASSIC** — Sandstones and Shales
- **CARBONIFEROUS** — Principally Granite and Diorite
- **CAMBRIAN** — Quartzite, Slate, Shale and Limestone
- **VOLCANIC SLATE SERIES** (Lower Paleozoic?) — Interbedded Slates, Flows, Tuffs and Breccias
- **PRE CAMBRIAN** — Gneisses and Schists

GENERALIZED GEOLOGIC MAP OF NORTH CAROLINA

Scale
0 25 50 100
MILES

ITACOLUMITE IN NORTH CAROLINA

By JASPER L. STUCKEY, State Geologist, Raleigh, N. C.

Itacolumite, also known as articulite and commonly referred to as flexible sandstone, has been defined (1957) as (1) a fine-grained micaceous thin-bedded sandstone, thin slabs of which have a certain degree of flexibility and (2) a schistose and flexible quartzite containing mica, chlorite and talc.

Itacolumite (flexible sandstone) has been reported to occur in three localities in North Carolina as follows: (1) The Sauratown Mountains of Stokes County, (2) The Kings Mountain district of Cleveland and Gaston Counties and (3) An area south of Linville Falls in Burke County. The Sauratown Mountain and Kings Mountain areas occur in the Kings Mountain group of rocks as shown on the 1958 geologic map of North Carolina. The Linville Falls area occurs in the Erwin formation as shown on the same map. The Kings Mountain group consists of quartzite, marble, conglomerate, and schist. The Erwin formation consists of predominantly interbedded, dark-green siltstone, sandy and silty shale and thin-bedded quartzite.

According to Mundorff (1948) the rocks of the Sauratown Mountain group consist "chiefly of quartzite and quartz-muscovite or quartz chlorite-muscovite schist. The quartzite is usually fine-to medium-grained, light-colored, and usually contains some silvery-white muscovite". He adds: "An interesting rock found at a few places in the Sauratown Mountain group is flexible sandstone, a fine-grained sandstone consisting of fine interlocking quartz grains and mica flakes."

Itacolumite (flexible sandstone) occurs in Stokes County in three localities as follows: (1) On highway N.C. 66 at Orchard Gap, near the village of Gap, (2) On Sauratown Mountain two miles southwest of Gap and (3) On Hanging Rock Mountain three miles southwest of Danbury.

Itacolumite (flexible sandstone) has been reported from the Kings Mountain district of Cleveland and Gaston Counties, but no localities where the material can be collected are on record in the office of the State Geologist of North Carolina. Quartzite, similar to that in Stokes County, is present in the Kings Mountain district and probably contains itacolumite.

South of Linville Falls in Burke County, the Erwin formation, also called Erwin quartzite, covers a large area. According to Keith (1905) this rock consists mainly of white quartzite with a little sandstone, some of which is feldspathic. The beds which are mostly fine-grained are composed of grains of white sand cemented by secondary silica. According to Conley (1958) "Itacolumite or flexible sandstone, occurs as boulders weathered from the Erwin quartzite along highway (temporary) N.C. 105, 5.5 miles northwest of Bridgewater. Boulders of italcolumite can also be found on highway N.C. 126 on the north side of the road, 0.3 miles east of its junction with highway (temporary) N.C. 105. The itacolumite in this area is generally inferior to the Stokes County flexible sandstone."

Itacolumite (flexible sandstone) has been known to occur in North Carolina for more than 100 years. It is only recently, however, that this material has become of interest to collectors. Approximately 100 years ago papers, which may be of interest to collectors of itacolumite, were published by Shepard (1845), Justice (1847), Lieber (1859) and Witherill (1867).

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THE HOT SPRINGS "WINDOW" OF NORTH CAROLINA

By FRED M. ALLEN, Jr.

President, Southern Appalachian Mineral Society, Lincolnton, N.C.

A somewhat unusual geological area which will be of interest to mineral collectors visiting North Carolina this summer during the Eastern Federation Show in Asheville August 7, 8, 9 is the Hot Springs window. This is an area of about 55 square miles surrounding the towns of Hot Springs and Marshall, N.C. Hot Springs is 20 miles northwest of Marshall and 42 miles northwest of Asheville along U.S. Highways 25-70.

A few graded dirt and paved roads, some ungraded logging roads and many trails, in addition to the highways, make the area relatively accessible compared to some other parts of the mountainous region. Highway, railroad and stream cuts aid the mineral collector in the study of minerals in the window.

The rocks within the window include, in ascending order, a pre-Cambrian crystalline complex and a thick sequence of sedimentary rocks of about 5,200 feet of clastic rocks of unknown age, at least 4,300 feet of clastic rocks of Early Cambrian age, and an unknown thickness of carbonate and fine-grained clastic rocks of Early and Middle Cambrian age. The rocks framing the window belong to the same formations.

The most important mineral resources in the area are barite, dolomite, shale and the hot springs located at the town of Hot Springs. Recent chemical analysis of the dolomite show that the rock is a highly magnesian dolomite which has many uses. Quarry sites, no longer in operation, are favorable locations for prospecting.

The Hot Springs window is somewhat similar in certain respects to the Engadine window of the Central Alps. Both are framed by more than one thrust fault and are therefore eyelid windows. The tectonic events which led to the formation of the Hot Springs have been interpreted as follows:

1. Thrusting of the sedimentary rocks over the crystalline rocks now exposed within the window; (2) Folding of the rocks now exposed within the window with development of NE-SW structures; (3) Relative northwestward movement of the lowest and first-formed of the thrust sheets framing the window, truncating the underlying anticlinical structure; (4) Thrust of an upper mass with clockwise rotation of earliest structures, producing east-west trends within the window; (5) Rupturing of this mass into three thrust sheets during continued or renewed application of forces.

The hot springs for which Hot Springs is named have attracted many visitors since they were first discovered in 1778. Available data strongly suggests that the waters are of meteoric origin and derive their heat from the geothermal gradient, but the nature of the artesian system involved is not known.

(Source: Geology and Mineral Resources of the Hot Springs Window, by Steven S. Oriel, 1950.)

100 ROCKHOUNDS OF NORTH CAROLINA

ARDEN—Gerald Medd, Dealers, SAMS

ASHEVILLE—Verne Aubel, 10 Sherwood Rd., Lap. SAMS; Burnham S. Colburn, 384 Vanderbilt Rd., Hiddenite, SAMS; Robert A. Campbell, 128 Pearson Dr., Lap. SAMS; Robert F. Giebert, Edgewood Knoll Apt. 11, Lap. SAMS; Peter C. Muffat, 20 Blackwood Rd., a/m, SAMS; Dr. and Mrs. J. P. Parker, 31 Woodvale Ave., a/m; Claude C. Platz, 79 Merrimon Ave., Dealer, SAMS; James A. Ray, 12 Caledonia Rd., a/m, SAMS; Mrs. Lee Schandler, 65 Austin Ave., Lap. SAMS; Dr., Mrs. and Martina Wadewitz, Red Oak Rd., a/m, SAMS; Mr. and Mrs. W. C. Whitehouse, 4 Waverly Court, a/m, SAMS; Mr. and Mrs. Robt. R. Williams, Jr. & Mike, 107 Evelyn Pl., a/m; Mr. and Mrs. Leslie Wilson, & Bascombe, 50 Elk Mt. Rd., a/m, SAMS; Roy Young, 3 Northwood Rd., a/m, SAMS

W. ASHEVILLE—Carson C. Foard, 62 Westwood Pl., Lap. SAMS; Earl West, 51 Princeton Dr., a/m, SAMS

AVONDALE—Carl A. Mauney, Lap. SAMS

BAKERSVILLE—Clarence Wilson, Route 1, a/m

BALSAM—Mrs. Rankin Ferguson, a/m, SAMS

BELMONT—Jack Hannahan, Belmont Abbey College, a/m, SAMS

BESSEMER CITY—Robert Ormand, 508 N. 13th St., a/m, SAMS

BILTMORE F'ST—Mr. and Mrs. Tom H. Humphries, & Anita, 21 Forest Rd., a/m, SAMS; Mrs. Tom Myers, & Tommy, 112 Stuyvesant Rd., a/m, SAMS

BLACK MT.—William S. Howell, a/m, SAMS

BRASSTOWN—Herman Estes, a/m, TSR; Fred O. Scroggs, a/m, TSR

CANTON—C. E. Barnett, a/m, TSR

CASHIERS—W. F. Lewis, a/m, SAMS

CHAPEL HILL—Robert W. Linker, 702 Gimghoul Rd., a/m; Boyd Mattison, 29 Jackson Circle, a/m, SAMS

CHARLOTTE—Howard S. Davenport, 5031 Withrow Rd., a/m, SAMS; Neal Floyd, 1928 Kelborne Rd., a/m, SAMS; Earl Yandle Jr., Box 1476, a/m

CHIMNEY ROCK—Donald Dalton, a/m, SAMS

COLUMBUS—Joseph C. Kovach, Lap. SAMS

CONCORD—Ralph Caton, Kerr St., a/m, SAMS

DURHAM—Mr. and Mrs. Lloyd Allison, 1811 Cheek Rd., Dealer, Guide, SAMS; Alton Price, University Apts. D-2D, a/m; James Roberts, 1605 Plymouth Rd., a/m, SAMS

ELK PARK—George M. Bowman, a/m

FAYETTEVILLE—Mary W. Freeman, 516 Valley Rd., a/m, SAMS; Weaver Hatcher, 1111 Claredon Rd., a/m

FLETCHER—Robert C. Salmon, a/m, SAMS; Harry J. Thomas, Lap. SAMS

FOREST CITY—Mrs. Fred Keller, and Bruce, Rte. 1, a/m, SAMS

FRANKLIN—Jim Brinkman, Dealer, SAMS

GASTONIA—John Hood Summey, 712 Carolina Ave.

GREENSBORO—Alex W. Claibourne, 2411 Camden Rd., a/m, SAMS; Marvin R. Jackson, 1300 W. Lake Dr., Lap. a/m, PMC

HAWK—Roby Buchanan, Dealer

HAYESVILLE—R. L. Anderson, a/m, TSR; R. G. Vick, a/m, TSR

HICKORY—C. E. Clevenger, 102 20th Ave. NW., a/m, SAMS; Mr. and Mrs. Fred Teague, & Keith, 1612 3rd Ave. SW., a/m, SAMS

HIGHLANDS—Miss Blanch Davenport, a/m, SAMS; Louis Dendy, a/m, SAMS; Dr. Thelma Howell, a/m, SAMS

LENOIR—Rev. and Mrs. James Peck, 108 N. Sharon Rd., a/m, SAMS

LINCOLNTON—Mr. and Mrs. Fred Allen, 830 N. Aspen, a/m, SAMS

MARBLE—Arthur Palmer, a/m, SAMS

MARS HILL—John S. Vance, a/m

MEBANE—Jesse Miller, a/m

MICAVILLE—Luther Thomas, a/m, Guide, SAMS; Floyd Wilson, Dealer, SAMS

MORGANTON—Mr. and Mrs. F. M. Bush, 110 Greenbriar St., a/m, SAMS

MT. AIRY—Dr. R. J. Lovill Sr., & Teresa, a/m, SAMS; Mr. and Mrs. W. E. Merritt Jr., Lap. SAMS

MURPHY—Dr. and Mrs. George Size, Lap. SAMS, TSR; W. E. Bates, a/m, TSR; B. J. Cornwell, a/m, TSR; C. R. Fried, a/m, TSR; George Bunch, a/m, TSR

NAPLES—Mrs. H. R. Hilford, a/m, SAMS

NEWLAND—Allen R. Ashley, Lap. SAMS

RALEIGH—Jeff Hill, 1936 Smallwood Dr., Fulgurites; Mr. and Mrs. O. F. McCrary, State College Stat., a/m, Lap. SAMS

RAMSEUR—Kermit Pell, Lap. a/m

RUTHERFORDTON—Don Arrowood, Route 2, a/m, SAMS

SALUDA—W. C. Ashley, a/m, SAMS

SHELBY—Yates Brooks, Route 4, Dealer, SAMS

SKYLAND—W. W. Austin, a/m, SAMS; Jean Willmer, a/m, SAMS

STANLEY—Jack Smith, a/m, SAMS

STONY POINT—D. O. Moose, a/m, Lap.

SWANNANOA—W. M. Graham, Route 1, Lap. SAMS

SYLVA—William E. Bacon, Dealer

TAYLORSVILLE—Mrs. R. S. Ferguson, & Laura, a/m, SAMS

THURMOND—Mrs. Ruth Stanley, a/m

TRYON—Charles Hare, Lap. SAMS

TUXEDO—Jim Baines, a/m, SAMS

WAYNESVILLE—Mr. and Mrs. M. J. Hamner, Rte. 1, a/m, SAMS; Mr. and Mrs., & Teresa, Lugar, Hazelwood, Lap. SAMS

WEAVERVILLE—Mr. and Mrs. George Broschardt, a/m, SAMS; Mr. and Mrs. Bernard J. Maquire, a/m, SAMS; Mr. and Mrs. George Stahl, a/m, SAMS

WILKESBORO—E. P. Robinson, N. Wilkesboro, a/m, SAMS

WILMINGTON—Ben H. Smith, 4013 Wrightsville Ave., Dealer, SAMS

WINSTON-SALEM—D. R. Holder, 4485 Indiana Ave.

CODE: SAMS—Member of Southern Appalachian Mineral Society
TSR—Member of Tri-State Rockhounders
PMC—Member of Piedmont Mineral Club
a/m—Collects all minerals
Lap.—Lapidary interests
Guide—Guide service to localities

The above list of rockhounds is not intended as a complete report on collectors in North Carolina. Rather it is a composite or cross section taken at random from newspaper clippings, mineral magazines, personal letters, and reports to the author. Mr. Fred Allen, of Lincolnton, who amended part of the list and gave other suggestions, aptly terms this roster "a list of 100 rockhounds which may be of interest to visiting out-of-state collectors."

C. Henry King
Franklinville, N.C.

World's Largest Hiddenite Collection

The largest collection of rare Hiddenite in the world will be on display at the Eastern Federation of Mineral Societies Show at the Municipal Auditorium in Asheville, N. C., August 7, 8, 9, 1958.

The collection of the emerald-green spodumene gem mineral is a combination of a collection owned by the University of South Carolina and one owned by Burnham S. Colburn who once operated the famed Hiddenite Mine in North Carolina.

Cut stones, single crystals and large matrix specimens will be included in the display.

Burnham S. Colburn, of Asheville, Permanent Chairman of the host group, the Southern Appalachian Mineral Society, will be on hand during the Federation Show to answer questions about the fabulous Hiddenite.

RADIOACTIVE MINERALS IN NORTH CAROLINA

By MRS. FRED ALLEN, Lincolnton, N.C.

Visitors to the Eastern Federation Show to be held in Asheville, N.C., August 7-8-9, 1958, will have a number of opportunities to satisfy their desires for radioactive minerals on the field trips which follow the show.

Radioactive minerals in North Carolina are present in pegmatites, placer deposits and to a limited extent in some granitic rocks. Most have been known for many years and thorium-bearing placers (monazite) were mined in the state as late as 1953. Secondary uranium minerals have been discovered in recent years in metamorphic rocks in the western part of the state, and because this section is underlain largely by this rock type it presents an interesting area in which to search for uranium-bearing and thorium-bearing rocks.

Following is a partial list of the radioactive minerals found in North Carolina and their general location. This outline is from a survey conducted by Richard J. Councill, a geologist with the Division of Mineral Resources of the State of North Carolina:

ALLANITE—This silicate of the rare-earth elements cerium, yttrium and lanthanum, sometimes mildly radioactive due to thorium, is present in pegmatities in Swain County north of Bryson City, in Madison County west of Marshall, in Wake County near Wake Forest, and in pegmatites and hornblendic rocks near North Wilkesboro in Wilkes County. The allanite-bearing pegmatites commonly occur in the contact zone between granites and older gneisses and schists.

AUERLITE—This dull yellow to orange-red silicate-phosphate of thorium is found in Henderson County where it is associated with zircon-bearing pegmatites.

AUTUNITE—This lemon to sulphur-yellow mineral, usually associated with uraninite, is found at some of the mica and feldspare mines in Mitchell and Yancey counties.

CYRTOLITE—This altered silicate of zirconium, containing uranium, yttrium and rare-earth elements, occurs in some of the pegmatites in Mitchell, Yancey and Henderson counties.

EUXENITE—This brownish-black mineral, containing yttrium, erbium, cerium, uranium, columbium and tantalum, is found in the pegmatites of Mitchell County.

GADOLINITE—This black to greenish-black mineral, quite similar to allanite but also containing beryllium, is found in contact-zone pegmatites in Ashe County.

GUMMITE—This mineral, composed of uranium, rare-earth elements, thorium and rare gases, is found in the pegmatites of the Spruce Pine district.

MONAZITE—This yellowish-green phosphate of cerium lanthanum, rare-earth elements and thorium, occurs in many stream deposits just east of the Blue Ridge in Burke, Cleveland, McDowell, Polk and Rutherford counties. It is found as crystals along contacts between gneisses and granites in Alexander and Madison counties, and as coarse crystals in the pegmatites of Mitchell County. It is also found in many of the granitic rocks of the North Carolina Piedmont and in the sands of the Coastal Plain.

POLYCRASE—This black-to-brown mineral, somewhat similar to euxenite, is found in the zirconium-bearing pegmatites in Henderson County.

SAMARSKITE—This heavy black mineral containing columbium, tantalum, rare-earth elements, calcium and uranium is found in the pegmatites of Mitchell County in masses weighing up to 20 pounds.

TORBERNITE—Torbernite and meta-torbernite have long been found in the pegmatites of the Spruce Pine district. Recently it has been found in northwestern Burke County and in granite-gneiss in Avery County. This emerald-green, micalike material stands out prominently in the host rock.

URANINITE—This heavy, black to grayish-black to greenish-black mineral, frequently altered to other radioactive minerals, including clarkeite and gummite, is found in the pegmatites of Mitchell and Yancey counties.

URANOPHANE—Often called uranotil, this lemon-yellow mineral is found in the same areas in Mitchell and Yancey counties in which uraninite occurs.

Other radioactive minerals in North Carolina include columbite-tantalite and as yet unidentified minerals in slates, quartzites and shales in Burke County and also unidentified minerals in granite-gneiss in Avery County.

DE SOTO WAS FIRST N.C. 'ROCKHOUND'

By MATTILEE H. ALLEN, Lincolnton, N.C.

The mountain region of North Carolina was known to the white man many years before Sir Walter Raleigh's first expedition to the North Carolina coast in July, 1584. Forty-four years before Raleigh's first attempt at settlement and 67 years before the establishment of Jamestown (1607), DeSoto, the Spanish exploror, and his army marched through the mountains of western North Carolina in a search for gold and silver.

In May, 1539, DeSoto landed in Florida with 600 armed men and 13 horses. Although his exact route has never been determined, it has been established that he came through the upper Piedmont of South Carolina and finally reached the headwaters of Broad River in what is now Rutherford County, North Carolina. The Cheraw Indians headquartered in this area, controlling a large area extending from the head of Broad River down into South Carolina.

Leaving the Cheraw section, they traveled west through a chain of "easy mountains 20 leagues across." This description, as well as what follows, is from that which DeSoto's chronicler made and is a fairly accurate description of a trip from the headwaters of the Broad through what is now Haywood County, across Balsam Gap, down Scott's Creek and on to the large Indian town of Cullowee in Jackson County. The statement goes as follows:

"Through a country covered with fields of maize of luxuriant growth (five days) we traversed a chain of easy mountains, covered with oak and mulberry trees, with intervening valleys, rich in pasturage and irrigated by clear, rapid streams."

At last they reached a "grand and powerful river and a village at the end of an island where pearl oysters were found."

From here they found their way on to Franklin. Positive proof that they were there has been found.

About seven miles below Cullowee is the town of Webster (site of the mineral Websterite) which is built on a ridge. In this ridge are tunnels which show evidence of having been dug with metallic tools. The first white settlers were told by the Indians that the tunnels were made by white men many years before.

In Macon County, old tunnels and shafts of similar age are found as well as in Cherokee County. In 1854 at the bottom of a shaft was found a well-preserved windlass showing evidence of having been banded by iron. Shafts show evidence of having been dug by sharp tools which Indians did not have. Other shafts have been proven to be more than 300 years old by the rings of trees which have sprung up in some of the diggings.

Arthur Palmer, a member of Southern Appalachian Mineral Society who lives at Marble, N.C., has a private museum which is open to the public. It includes a fantastic collection of North Carolina minerals and Indian artifacts. There are more than 20,000 Indian relics, four Spanish axes, one Spanish cannon barrel, and a large pick with the wooden handle still intact. He also has a large number of staurolites (Fairy Stones) for which this immediate area is well known.

WNC EMERALD MINES TO BE REOPENED

By ASHTON CHAPMAN, *Citizen-Times, Correspondent*

From Asheville (N. C.) Citizen-Times–July 1, 1957

LITTLE SWITZERLAND, N.C. June 29 --Widespred interest is felt in plans for reopening the famous old emerald mines at an elevation of 5,000 feet on Crabtree Mountain some three miles northeast of here, in Western North Carolina.

This is one of the few spots in the United States where real emeralds have been discovered and is said to be the only place in this country where extensive mining for emerald crystals has been conducted.

First step toward resumption of operations here was the recent issuance by Secretary of State Thad Eure of a certificate of incorporation to Little Switzerland Emerald Mines, Inc. with an authorized capital of $100,000.

TWEET PRESIDENT

W. B. Tweet of Augusta, Ga. has been named president of the new corporation. W. C. Meekins and Landon Roberts, both of Asheville, and Doris Oates of Gerton are listed as the incorporators.

According to the report of a survey of the property made some time ago by the Minerals Division of the State Department of Conservation and Development:

"At the Crabtree Mountain locality in Mitchell County, the emeralds occur in pegmatite enclosed in mica gneiss. The pegmatite has a northerly strike and dips 45 degrees–50 degrees east. It is composed mainly of feldspar, quartz, black tourmaline and beryl, and encloses horses of biotite-tourmaline schist.

"The emeralds occur sparingly through the pegmatite, but are more plentiful in the upper eight inches under the hanging wall where many are in small bunches and horses of schist.

"The gems are 'frozen' in the pegmatite. Small crystals of emeralds are abundant, and the color of many of them is good emerald-green. Some are pale-colored or yellowish. Occasionally gems of value have been found."

DISCOVERED IN 1890

The site of the emerald mines on Crabtree Mountain was discovered quite by chance about 1890. The late Alfred Chrisawn was cultivating a field on property then owned by the Estate of Thomas Sparks Sr. which was subsequently acquired by the late J. E. Jamerson of Estatoe and is now owned by Charlie Woody of Estatoe.

Chrisawn is said to have taken an after-lunch nap with his back against a tree. When he woke up he saw at his feet an unusual grayish-white rock with greenish streaks.

Some time later Chrisawn showed the specimen to J. L. Rhorson, a New Yorker who had come to Bakersville as a buyer of Toe River Valley minerals, principally mica.

Rhorison, unable to identify the specimen Chrisawn brought in, placed it among the collection of mineral curiosities in his office.

Nearly two years elapsed before a visitor from New York saw the Chrisawn specimen and expressed interest in it. Rhorison presented the specimen to him and promptly forgot all about it.

Rhorison's friend kept it for some time, then gave it to a friend of his own from Chicago. This Chicagoan finally had it examined by a professional mineralogist. The expert promptly declared the greenish streaks in the specimen from Mitchell County to be emerald crystals.

Rhorison, in association with the late D. A. Bowman of Bakersville, secured a lease on the mineral rights at the location. Holes were drilled, dynamite was exploded and the resulting chunks of ore were hammered apart. They were found to be penetrated in all directions by pencil-like hexagonal prisms, perfect in shape and good in color.

Operations proceeded feverishly. Sev-

eral log builings, including a gem-sorting shed, were erected near the mouth of the pit, which angled deeper and deeper into the earth. A steam engine was brought in to pump out the continuous seepage of water and to turn the drum for the tram car cable which brought the ore to the surface.

Operations were assumed by the American Gem and Pearl Co. of New York, which continued them until 1904. The lease to the mineral right was acquired about 1930 by Edward Fortner of Spruce Pine and the late J. P. Grindstaff of Kalmia. Fortner and the Grindstaff Estate have sub-leased these rights to the recently incorporated Little Switzerland Emerald Mines Inc.

The mines, consisting of three shafts, one of which is some 200 feet deep, were reopened in 1919, 1935 and 1942. None of these operations continued very long, although a new vein was reported discovered. The expense of the work, most of which was done by hand, simply did not make the returns sufficiently profitable.

It is believed that the improved methods which the new lessors plan to put into operation will result in more profitable operations than in the past. Many mineralogists have expressed the belief that the mines contain at greater depths many more valuable emeralds than have yet been brought to the surface.

Gems as large as three-quarters of a carat have been cut from crystals taken from the Little Switzerland emerald mine. A good specimen of emerald from this mine has been on exhibit in the Museum of North Carolina Minerals at Gillespie Gap on the Blue Ridge Parkway about three miles from Little Switzerland.

August 7, 8, 9, 1958, the dates for the Eastern Federation of Mineral Societies Show in Asheville, N.C., will be an ideal vacation time with the mountains of the area in their full beauty as shown in a typical view above. There may not be gold in those hills, but there are more than 300 other minerals waiting to be found by rockhounds.

View above is of Cowee Valley, Macon Co., N.C., famed ruby area.

WOMEN'S CORNER OF R&M

Conducted by Winnie Bourne
c/o Rocks and Minerals
Box 29, Peekskill, N. Y.

Experiences of 2 rockhounds in North Carolina

Being born in a Mineral State like North Carolina and having so many beautiful minerals lying around, I can't understand why more of our people don't have an interest in mineral collecting. My 13-year-old daughter (Sandra Jo Parsons) and I do a lot of collecting. We live on a small farm in the farming district of the Piedmont section of North Carolina. We spend almost every Saturday and holidays out roaming these hills and mountains. We pack our lunch, dress like old prospectors, get into our car and drive as far as we can, then park and start walking and looking. We have visited many old mines that hadn't been worked for a long, long time.

One cold day about the first of last March, we decided we could do a little prospecting in our own county (Surry) deep in the Blue Ridges. We drove about 10 miles, then we walked the rest of the way because it was straight up a mountain stream. As we went along we enjoyed the beautiful scenery, the falls with rainbow trout lurking in the water, and the many deer running through the woods. We kept on climbing because each new waterfall would become more inviting. All I regretted was that we did not have our camera. Although the pictures seen are still stamped on our minds, we would like to have them on film to show to others. We collected some beautiful citrine quartz (gem quality) on this trip.

I will admit that a rockhound's life is not always a bed of roses. For on one of our trips we had bad luck. We planned the trip and had everything ready to leave early on a Saturday morning. We left home around 6:30 a.m. and drove about 25 miles to a spot on a National Parkway Scenic Highway. We pulled off the highway about 100 yards and parked on an old mountain road that used to be traveled by an ox cart. We knew that a vein of smoky and citrine quartz was about two miles down this mountain road and we wanted some for our own collection and for exchanging. This was good faceting material, for two professional gem cutters had told us so. We reached the locality and started digging. We dug and dug and the deeper we dug the better quality was the material. When we finished digging we carefully wrapped our finds and literally dragged three heavy loads up the old road. We made three trips in all. We were so tired after the third trip that we did not have the strength to go back for more. It was 3:30 p.m. by now, cold and windy, and we were as dirty as coal miners. I don't know why we did it, but on this trip we had taken along some extra clothes and an old thermos jug full of warm water for washing ourselves. I will always thank my lucky star for this bright idea—a change of clothing and the warm water! Soon we were ready to head for home but when I tried to turn the car around, the back wheels began to spin, which threw the front wheels around and off the bank they went. The more I tried the worse I got stuck. Knowing all the time that very few traveled this parkway during cold weather, and that no one lived within miles—only a few summer homes scattered along and vacant this time of year —we went out on the parkway and stood there in the cold wind for what seemed like two hours when, finally, we spotted

a car approaching. We stopped the car, which had a Pennsylvania license, and asked the driver if he would stop at the Ranger Station eight miles on down to tell him of our predicament. We kept on waiting in the cold wind until we were almost frozen blue (the sun had already sunk in the west and it was dark) when suddenly two men in a pickup reached us—the Ranger had sent them. They pulled us out without any trouble and started backing out when the truck struck a rock and threw its wheels off the road. Well now we were in a nice mess for fair. We couldn't get the truck out and we couldn't pass it. Were we worried? We were. My husband would also be worried. The hours dragged by slowly as we sat there in our car, the men in their truck, all waiting for the Ranger to show up as we knew he would do so. When the Ranger showed up, the men went back with him in order to fetch a tractor which in due time arrived, pulled the truck to safety and we were free to go. (I never knew it could get so dark as we soon learned, sitting alone on that lonely mountain road till after 10:00 p.m.) In the meantime my husband had gotten so worried that he came looking for us and arrived just when the tractor did; he was so pleased that we had suffered no accident that he never scolded us but instead paid gladly the outrageous fee the men charged for pulling us out. Do you think a little thing like this would discourage a rockhound? No sir! We were ready to go on another trip the very next day, after church.

We know a place down the river from our house that is good fishing water. And between our home and the fishing water is a spot for beautiful gray-blue quartz and Indian arrowheads. We went the rough way, over a large bluff and then down to the fishing hole. We pulled off our shoes and waded the icy water to a rock out in the middle of the stream where we could do some real casting. Sandra placed her shoes on the rock so she could warm her cold feet. The tackle box fell into the water, she grabbed for it and knocked one shoe into the swift water—and all we could do was to watch it sail away! The tackle box and all our fishing gear, including a borrowed knife, started floating away also but it soon collected water and sank in 4½ feet of water. The borrowed knife worried me so there was nothing else for me to do but to wade into the deep chilly water so as to scuttle the box into shallow water where it could be picked up. We decided by now that we had enough and to go home to kill the black cats and burn all the ladders. Then Sandra slipped on a slippery rock and into the water she went! Luckily she saved both socks for one foot, so we drobbled and hobbled the long way back home for fear someone would see us. We were dry by the time we reached home, but not discouraged.

As soon as we get our spring planting done we are going on another trip. For you haven't lived until you live the life of a ROCKHOUND!

Mrs. Ruth Stanley
Rt. 1, Box 34
April 22, 1958 Thurmond, N.C.

Unusual North Carolina Show Exhibit

One of the most unusual and most interesting exhibits at the Eastern Federation Show in Asheville, August 7, 8, 9, 1958, will be one featuring the finest specimens ever collected in mineral-rich North Carolina.

A special committee has been busy for months inspecting the best private and public collections in the state. From these have been borrowed the best specimen, such as aquamarine, emerald, garnet, gold and so on for about 200 varieties.

These will be displayed in a special case which provides an electric button by each specimen. When the button is pressed by a visitor to the Show, a light will flash on a large map of North Carolina above the display, showing the exact location where the specimen was found.

THE DEVIL'S TRAMPING GROUND

A Pedologist's Enigma

The systematic study of unconsolidated rock, or soil, is a comparatively new science known as pedology. The growing number of pedologists in our midst is a testimonial of its increasing importance in geological investigations. Soil science does not benefit agriculture alone.

At present the pedologists are concerned with problems of a practical nature. Small occurrences of peculiar soil have not yet gained their attention. Nevertheless, rockhounds in general should note such occurrences in their district so that a ready exchange of information be available to all who are interested.

As an initial step in that direction, the writer would like to record an oddity in Chatham County, North Carolina, known as the Devil's Tramping Ground.

Whenever local conversations leaned toward the "fact is stranger than fiction" theory, someone would inevitably mention the Devil's Tramping Ground. As a newcomer in this area, an inquiry as to further detail was in order. Such solicitation revealed that it was a circular path about 18 inches wide and about 35 feet in diameter. Although located in level woodland, its singularity, aside from the geometric pattern, was that no vegetation has ever been known to grow in this path, even though grass and mature trees grew right along its perimeter.

Now such reported phenomena is like a magnet to the writer's curiosity and the attraction was not long in evoking a trip to said place. On the first convenient Sunday the writer and Mr. William Frazier, of Franklinville, N. C., proceeded to Siler City, Chatham County (junction U.S. 64 and U.S. 421) and thence south to Harper's Cross Roads. Distance: about 14 miles over this road. N. C. Highway #902 junctions here. Proprieter of a small store here provides directions to the Devil's Tramping Ground which is one and one-half miles distant on a dirt road. The spot is on the left hand side and about 50 feet in the woods from the road. It can hardly be missed from the trail of picnic papers and other debris left by thoughtless sightseers.

Well, there it was, a circular path, no vegetation, the soil appeared commonplace to these eyes. The dimensions appeared as aforementioned. An oddity it is. It has been the subject of conjecture for generations.

Since that visit a collection of legends and theories about the Tramping Ground have been collected from friends and acquaintances. A few are interesting enough Americana to include here. In order of popularity and fantasy they are:

1. The Devil walks around this path at midnight. His evil potency has destroyed the plant life. This myth fathered the name.
2. The circle was the council ring of the Indians. Used for a long, long period left an indelible mark. To this is added the story that an important chief is buried in the center. A variation is that the Indians buried a treasure at this spot. (The creed of the Redman allowed for the reverence of natural phenomena because it was an act of The Great Spirit and therefore such reverence was regarded as veneration for Him. Undoubtedly, if the Indians were familiar with this spot, it was held in esteem; may even have had ceremonial significance. However true this may be, it does not support the present day allegations.)
3. That a metorite fell here. (There is no depression, the area is all level like the surrounding woodland. As if further proof were necessary, you could allow for erosion fill, but that would be adjacent soil not subjected to original chemical alteration. Simpler still, soil rebuilds itself in a period of years.)

4. That this was a site of a pioneer industry such as a grist mill. Horses and mules were harnessed to traverse a circle and create power at a central grinding device. (Again, no amount of trampling would deter plant life more than a few seasons. There are no foundation evidences in the vicinity, nor anyone ever heard of such.)

To get back to fact, the Devil's Tramping Ground is just what it has always been: a small amount of unproductive soil freakishly deposited in a geometrical pattern. It antedates white occupation.

A newspaper clipping[1] concerning the tramping ground returns us to pedology: W. B. Morgan of Siler City, N. C., sent a sample of the soil from the path to W. A. Bridges Laboratory in Wilson, N. C. For further test some was forwarded to The Soil Testing Division of the North Carolina Department of Agriculture. The tests showed that the soil is sterile. Mr. Bridges was quoted as follows: "Although there may be other factors of a physical nature that would make this a sterile soil, our findings will show that plant life will not be supported on a soil that is so acid and so low in the necessary soil nutrients." There was an allusion that something in the subsoil may be the cause.

And to finish with the words of Mr. W. B. Morgan: "... science has proven that the soil in the path of the Devil's Tramping Ground is sterile ... but it has not proven why it is sterile."

1. Devil's Tramping Ground Mystery Partially Solved; Soil Analysis Made. Courier-Tribune, Asheboro N. C. 25 November 1946.

C. Henry King
Franklinville
N. Carolina

METEORITE FROM CASTALIA, N.C.

On May 14, 1874, a meteorite fell at 2:30 p.m. at Castalia, Nash Co., N.C. It was a stony meteorite consisting of a dozen or more pieces totaling 16 lbs. in weight.

In preparing this Special North Carolina Number, Mr. James H. Mackintosh, 934 Paulding St., Peekskill, N.Y., loaned the Editor a large number of his father's old letters that have been written by William Earl Hidden, mineralogist and prospector, after whom a town and a mineral were named. The town is in Alexander County, N.C., where a greenish gemmy spodumene was first found and each is named, Hiddenite.

The letters were all addressed to James Buckton Mackintosh an eminent chemist in his days, and for whom a rare thorium and uranium mineral was named mackintoshite (found at a gadolinite locality in Llano County, Texas).

Hidden and Mackintosh, Sr., were friends and they corresponded regularly. Hidden spent many years in North Carolina, mining gems and thorium minerals; Mackintosh was stationed in New York City working for the Consolidated Gas Co.

Here is a letter relating to the meteorite that fell at Castalia, N.C.

Stony Point, N.C.
Alexander County
Oct. 23rd 1886

Dear Mack:

After a very round about route I reached the mine (hiddenite mine) on Thursday night and a more worn out man you never met with. Since I left Bethlehem (Pa.), I did not have any decent rest until last night here at the mine. You will be glad to know that I was fortunate in getting the 12 lb. stony meteorite for one hundred dollars. The *Gold brought* it as I thought it would. It *fell* May 14th, 1874 at 2:30 p.m. near Castalia (a very small settlement), Nash County, N.C. I drove 57 miles from 9 a.m. to 6 p.m. last Tuesday in order to reach the meteorite and not lose my limited ticket which expired on the next day at midnight. I made all connections and accomplished all I planned to on my way down here.

Next Monday I shall be able to commence work again and may work uninterruptedly until Xmas. Weather here beautiful and splendid for good work. I do so wish you were here to see the progress of gem discoveries and enjoy the peace and quiet of this healthful region.

Hidden

THE CHAPLAIN'S PAGE

Editor's Note: It is believed that the Southern Appalachian Mineral Society is the only such organization in the country with an ordained minister as Chaplain. While only a few field trips during the summer are held on Sundays, when such occasions arise, the Chaplain conducts brief impressive services in the field. Rev. James C. Peck, Chaplain of Southern Appalachian Mineral Society, is an Industrial Chaplain for Broyhill Industries, Lenoir, North Carolina.

THE PERFECT IDENTIFICATION

The mineralogist identified the specimen in terms of its environment, its crystalline structure, its physical properties as to color, hardness, specific gravity. He spoke of chemical composition, analytic tests and of other distinguishing characteristics. He finally listed other places where galena, the chief ore of lead, may be found.

Through identification he associated the specimen with another already known.

The process of identification exists in all human experience. Through it a person becomes the same with other persons, groups, or causes. In it his basic need to belong is fulfilled.

In our associations we make a thing to become a part of us and we of it. If the identification is complete we may even sacrifice the pleasures of the body and life itself to preserve that with which we identify.

A boy and his dog were almost inseparable. There are at least two ways to start a fight with such a boy. One, kick the boy, two, kick the dog. You can do things to the boy that he won't let you do to that dog. He will often make some very real sacrifices for that dog without counting the cost.

Persons likewise identify. They identify themselves with their country, their branch of the service, their buddies, their work, their hobby, and then run great risks, risks that no amount of money or effort could persuade them to take otherwise.

"The mail must go through," The show must go on," "Our organization must succeed" represent attitudes we have seen in those who have identified themselves completely with a career, profession, or, a cause. There are the individuals about whom success stories are written.

True friendship has something of this identification idea in it. The person who is our best friend would help us when the chips are down, without counting the cost. This, we believe, and, we would measure his friendship by the net sacrifice he would be willing to make for us. A little sacrifice, little friendship, great sacrifice, great friendship. You sink or swim together because you have become identified in a common cause together.

The discovery, perhaps, that your "best friend" is in actuality, "using you" for self gain makes him an "acquaintance of convenience," no longer a best friend. (Nothing wrong with having such but they are not true friends. It is like using related minerals to help identify the real thing).

It is not healthy to believe that everyone is looking out for himself at all times. Of course we are interested in our own desires and that is as it should be. Galena must give up its own identity in order to become the more valuable lead.

Identification has nothing to do with imitation. It is a real process through which we become like, or part of another in attitudes, feelings, beliefs, and hence, behaviour. A specimen isn't really yours until you have identified it, or yourself with it, completely.

The things that we make "ours" have a special attraction. Our way of life depends on how much we are willing to become the same with others. How

much are we willing to make them a part of ourselves? A specimen is shelved apart until it is identified as a part.

Our children, *our* home, *our* church, team, town, club. *Our* mineral society.

"Whom do you say that I am?" Jesus Christ asked of Simon Peter, Spokesman of Apostles. He identified himself as he made the perfect identification. "Thou art the Christ, the Son of the living God."

Peter, sometimes later, was to give his life for His cause.

James C. Peck, Chaplain
SAMS
5/16/58

Screening for rubies can be an added attraction for those attending the Eastern Federation Mineral Show in Asheville, N.C., August 7, 8, 9, 1958. The ruby area of Western North Carolina (Cowee Valley, Macon Co.) is just a short drive from Asheville. The proper "technique" is demonstrated here by a couple of lady rockhounds.

MEET YOUR EASTERN SHOW CHAIRMEN!

When the Mayor of Asheville, N. C., cuts the ribbon opening the 8th annual International Show of the Eastern Federation of Mineral Societies on August 8 in the Municipal Auditorium of that famed tourist mecca, it may seem that members of about 40 societies of the Federation and commercial dealers just moved in the day before and set up displays.

Such is far from the truth. Immediately after the Federation selected Asheville as the site for this year's Show, committees were immediately formed and have been hard at work up to this date and will be throughout the Show.

Host to the Show, the Southern Appalachian Mineral Society, has about 200 members, but many of these live far from Asheville, from New York to Florida to California. So a steering committee performed most of the original groundwork, bringing in more and more members as time grew nearer the dates of the Show.

There were problems galore, some simple, some major. The steering committee heads met at least once a month. With fingers crossed, the Southern Appalachian Society believes that all problems have been solved by this time and that the Show will be the best ever held in the East.

It would be impossible to list here all who have devoted much of their time, driving thousands of miles, spending hundreds of dollars on telephone calls, for the Society. The list below is of the committee chairmen of the host club, but virtually every member will be on hand during the Show to make guests feel the real Southern hospitality that prevails in the Carolina area. Rosters of members of the Society will be available at the registration desks, and members will welcome guests at the Show on their return home and on the field trips which are scheduled for a week following the Show.

Convention and Show Committee Chairmen for the Show are as follows:

Robert R. Williams, Jr., a very busy attorney in Asheville, as General Chairman has devoted a tremendous amount of time and energy coordinating all of the committee work.

Vice chairman Robert Campbell, with the U.S. Forestry Service in Asheville, has shared administrative problems with the General Chairman.

Money problems always are complex in a Show of this type but they have been ably handled by George Stahl, of Weaverville, an electronics manufacturer by profession.

Commercial displays have been handled by Gerald Medd, a commercial dealer himself in minerals and employed in the production of rayon and nylon at nearby American Enka Corporation.

Non-commercial displays have been ably handled by William C. Whitehouse, formerly with the New York Telephone Co. and now of Asheville and Bermuda.

Special exhibits, and outstanding ones, have been negotiated jointly by Dr. James Parker, Research Department of American Enka Corp., of Asheville, and W. E. Merritt, retired hosiery manufacturer of Mt. Airy, N. C.

Publicity and advertising have been developed by Fred Allen, President of the Society, Lincolnton, N. C. who handles similar work for industries in the East and South.

General arrangements have been under the tender care of Mrs. R. R. Williams, wife of the General chairman, and Mrs. William Whitehouse, wife of the Special Exhibits Chairman, both of Asheville.

One of the big attractions of the Eastern Federation Show is the seven days of guided field trips immediately following the show. These have been developed by Otis R. Lugar, a rubber research chemist of Waynesville. Many of these locations are not open ordinarily to collectors but all who register at the

Show will be eligible to participate in the trips.

Dr. Martin Wadewitz, head of the research department of a large synthetic yarn manufacturer, has arranged an outstanding panel of special speakers for the meeting.

Miss Martina Wadewitz, Secretary-Treasurer of the Southern Appalachian Mineral Society, developed the official program.

William D. Turner, an Asheville hotel manager, is chairman of housing arrangements.

NORTH CAROLINA HAS FOUR MINERAL SOCIETIES

There are four very active mineral societies in North Carolina.

The largest of these is the Southern Appalachian Mineral Society, host to the Eastern Federation Show in Asheville, August 7, 8, 9, 1958. With headquarters in Asheville, this Society has about 200 members located from Maine to Florida to California.

The SAMS group holds organized field trips every other weekend from Spring through the Fall months. The annual meeting is a dinner affair, including a contest for the best mineral specimens found during the year, held in January each year.

Officers of SAMS are Burnham S. Colburn, Sr., Permanent Chairman; Fred M. Allen, Jr., Lincolnton, N. C., President; Otis Lugar, Waynesville, and Gerald Medd, Arden, N. C., Vice Presidents; Miss Martina Wadewitz, Asheville, Secretary-Treasurer; Rev. James Peck, Lenoir, N. C., Chaplain. The directorate is composed of those officers and Dr. Martin Wadewitz, of Asheville, and William E. Merritt, Jr., Mt. Airy, N. C., Dr. Thelma Howell, Highlands, N. C., and Floyd Wilson, Micaville, N. C.

The Central North Carolina Mineral Society has headquarters in Raleigh and meets the first Wednesday of each month, 7:30 P.M., at Page Hall, N. C. State College.

Lloyd A. Allison, Durham, is President; Dr. E. L. Miller, Jr., N. C. State College, Vice President and Orville K. Barnes, Raleigh, is Secretary-Treasurer.

The Smoky Mountain Lapidary Guild is located in Waynesville, N. C. Wesley Gibson, Waynesville, is President, and Tom Moses, Canton, N. C., is Secretary-Treasurer. Meetings are held each Thursday and field trips each weekend.

The Tri-State Mineral Society has headquarters in Murphy. Located near the borders of North Carolina, Tennessee and Georgia, this Society lists members from these three states. Field trips are held frequently.

Officers of the Tri-State Rockhounders are Howard Martin, President, Murphy, N.C.; Martin Cunningham, Vice President, Sylva, N.C.; Mrs. H. B. Estes, Secretary, Brasstown, N.C. and Mrs. Virginia Size, Treasurer, Murphy. Field Trip Committee: W. E. Bates, Murphy, Chairman; Arthur Palmer, Marble, N.C. and Fred O. Scroggs, Brasstown, N.C.

Seven Days of Field Trips Planned

By OTIS LUGAR

Federation Show Field Trip Chairman

When the three-day Eastern Federation Show comes to a close August 9, 1958, in Asheville, N.C. the fun will just be starting for those who have registered during the Show.

The reason: There will be seven full days of guided field trips to choice Western North Carolina mineral localities. A number of these are not open to collectors but special arrangements have been made for this one time. Other locations are so situated that it would be difficult for a stranger visiting in the state to find them.

The Show Field Trip Committee guarantees that all making the field trips will have "bucketfuls" of specimens to take home!

Fossil Department

Conducted by Howard V. Hamilton
1340 Crandall Avenue
Salt Lake City 6, Utah

FOSSIL COLLECTING IN NORTH CAROLINA

By RICHARD L. CASANOVA

Aside from the minerals and gems for which North Carolina is justly famous, collecting within the state is not restricted to these two phases of the mineral-world, but also provides the fossil collector and earth-science student with a wealth of specimens, ranging in size from the lowly microscopic invertebrate to reptiles now on exhibit in northern museums.

Fossil collecting in North Carolina had its beginning with the appointment of Ebenezer Emmons to the State Survey, back in the middle 1850's. Most specimens collected as oddities by the farmer were submitted to the Survey office in Raleigh, labeled as coming from the marl beds, although five or six periods were at that time recognized. These collections were studied and described in some detail by Emmons, and illustrated in 1858 with such excellence that this report is still of inestimable value today to the field collector.

Unlike many of our states, North Carolina is not over-rich in its fossil outcrops, such fossiliferous exposures restricting themselves to a wide belt of Cretaceous beds in the south-eastern part of the state, abundantly producting a large and varied series of invertebrates, as pelecypods and belemnites, and crustaceans. Following the Cretaceous, or rather overlying it, and extending northward from Charleston, South Carolina, we find a belt of very rich Tertiary and Quaternary exposures, the specimens showing little alteration, and as fresh in preservation as though living in the ocean today. The only exception to this form of preservation is to be found in the fossils of the Castle Hayne limestone of the Eocene, where the fossils occur as casts and molds.

Marl pits and phosphate quarries in New Hanover, Pender, and Duplin Counties bear the richest outcrops of Eocene and Miocene fossil beds. Here, collecting of weathered-out specimens is fairly easy and good collections can be made. From Brunswick County, North Carolina, through Horry County, South Carolina, extremely rich exposures of Pliocene and Pleistocene outcrops along the Intracoastal Canal will provide the collector with a tremendous quantity of varied species, including large sand-dollar type sea-urchins, and on rare occasion, vertebrate material as molars of horse, mastodon and pig, with an equally rare reptilian leg or rib bone. These wash out from exposures along the Cape Fear River and turn up, along with Cretaceous mollusca and echinoids, along the beaches, from Carolina Beach, south of Wilmington, to Myrtle Beach, in South Carolina.

The furthest west that fossils can be found in our state, is within the Fort Bragg reservation, but here only Cretaceous foraminifera can be found.

An excellently illustrated Regional Guide to the fossil faunas of the Carolinas is in preparation and when printed will be of great interest and value to the mineral, as well as the fossil collector.

TARHEEL TALUS

The PIEDMONT MINERAL CLUB, of Greensboro, N. C., meets the first Monday of each month at South Greensboro Community Building on Asheboro Street. The club has about 30 members. Although organized for some time, it has not been widely publicized.

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As this is going to press, the Division of Mineral Resources, N. C. Dep't. of Conservation and Development, is preparing a booklet especially for the rockhound. It will tell where to find those minerals most sought after by visiting rockhounds. Maps will be included. The booklet, expected to be available in June, will sell for about 75¢. The title is: Information Circular #16—"Mineral Localities of North Carolina." Available from above Department, Raleigh, N. C.

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A new rockhound organization has been formed in Forsyth County, N. C. It is called THE WINSTON-SALEM MINERAL CLUB. It meets the first Thursday of each month in that city. Contact Dr. Anscomb.

• • •

It is understood that the Asheville, N. C., Public Library will be built up as the "Mineral Library." Special funds will allow for purchase of a wide assortment of mineralogical literature, including rare and out-of-print volumes. Literary rockhounds check this!

• • •

The Greensboro Junior Nature Museum, of Greensboro, N. C., is building up a creditable display of minerals. Fluorescent minerals are now featured.

• • •

Anyone who would like to write an article about a North Carolina mineral or locality, but feel that they don't quite know how to go about it, may have their article co-authored free providing the article is contributed to ROCKS AND MINERALS. Contact Mr. Zodac, the editor of R&M for my address.

• • •

One "lore and legend" type of scrapbook this writer would like to suggest is the collecting of mineral and geological postmarks. They would be especially appealing to anyone who cannot get into the field: the aged, the infirm, or just those among us whose legs are about to give out! The idea is to get an envelope, or card, postmarked in a town with a mineral name or geological significance. Do not cut out the postmark, but mount the whole envelope, or card, in your book. See how many minerals (or other selection) you can assemble.

Visitors to N. C. during the Eastern Federation Convention may pass through towns with names suitable for collecting. If you know of a bedridden rockhound just send a card, or letter, from that town and it will be postmarked from there. Of course tell the person to save the postmark for a scrapbook. Among the N. C. towns suitable for this purpose are:

Jasper	Barium Springs
Sapphire	Granite Quarry
Emery	Mineral Springs
Gold Hill	Granite Falls
Micaville	Tungsten
Hiddenite	Gold Rock
Marble	Zirconia
Gold Point	Iron Station

C H. K.
Franklinville
N. Carolina

Photo on the cover

The photo on the cover of this issue was sent in by Reo N. Pickens, Jr., 610 N. Martin, Waukegan, Ill. Mr. Pickens is a photographer whose specialty is photos of minerals in color. The photo is of a beautiful kyanite crystal in matrix from Balsam Gap, N.C.

WITH OUR ADVERTISERS

Conducted by James N. Bourne
c/o Rocks and Minerals. Box 29
Peekskill, N. Y.

Advertisers are cordially invited to submit News Items to this Department

Mr. & Mrs. Gerald R. Medd, Fort Shuford Mineral Shop, Arden, N.C., and currently advertising in R&M, will occupy booth #28 at the Eastern Federation Convention in Asheville, N.C., August 7, 8, and 9. They'll be very happy to have visitors stop at their booth or at their Fort Shuford Mineral Shop in Arden, N.C. Take note of their display ads this issue.

———

We are quite pleased to hear from Edward J. Platt, Gen. Mgr. of Technicraft Lapidaries, 3560 Broadway, New York 31, N.Y. Mr. Platt made us the recipient of three very nice specimens for our collection and we are grateful to him for his kindness in doing so.

The specimens are as follows:

1. Lapis Lazuli from Chile, a sample piece of mine run, very good by the way for mine run material. Specimen is of bluish color and gem quality. Technicraft Lapidaries are interested in dealers to distribute this material as it represents true value to both wholesaler and amateur cutter.
2. Celestite crystals. Whitish crystals on rock from Racalmuto, Sicily. A large stock of these very fine specimens from small sizes to beautiful large size museum pieces are on hand. Very fine quality.
3. Sulphur crystals. Also from Sicily, yellow lemon in color, fine quality, museum grade, plentiful in stock.

Note: To dealers, wholesalers, amateur cutters and collectors, contact Technicraft Lapidaries Corp., 3560 Broadway, New York 31, N.Y., for some fine material as mentioned above while they still have a large supply on hand. You'll be quite pleased. A note from Edw. J. Platt, Gen. Mgr., reads:

"We have all sorts of lapidary supplies and equipment for the hobbyist, cutter, and jewelry maker. Stop in at our store and look around, as you'll find practically all your needs right here and we're just waiting to cater to you."

———

We recently have been informed that Mr. & Mrs. Ernest W. Beissinger, 417 Clark Building, Pittsburgh, Pa., who regularly advertise in R&M, and are importers of precious stones, have just returned from an extensive buying trip to South America. They informed us that they bought large quantities of rough faceting material, which is now being cut into finished gems at the Beissinger's own shop in Idar-Oberstein, Germany. Inquiries are invited.

Note: The Beissinger's offer wholesale faceting service at their shop in Germany by master craftsmen at a reasonable price. Have them do some for you.

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E. M. Sewell of San Francisco Gem Supply, P.O. Box 1770, San Francisco, Calif., advertising via our display section this issue wishes the following item passed along to our readers:

"We have just made arrangements to purchase directly from the mine a supply of Covelo Jade (Jadeite). You are, no doubt, familiar with this material and our initial supply is of excellent quality and color. All of it is green in varying amounts, and all choice material. Although this deposit contains both jadeite and nephrite, the mine owners are only taking out the jadeite at this time."

Note: Mr. Sewell invites your inquiry and order as to above material, so drop him a line.

Here's a letter below received from George A. Bruce, Pres., International Import Co., 604 Peachtree St. N.E., Atlanta 8, Ga., that we are more than pleased to print:

"Dear Mr. Bourne:

"I believe it will be of interest to you to learn of the results of our recent offer to gem, mineral and astronomical societies of displays of the agni manis (tektites). Two were held recently. One of your advertisers, Prof. Wendell B. Johnson, The Gem and Rock Shop and a professor at Milsaps College, was in charge of a very informative meeting in Jackson, Mississippi. The other was held by the Rapid City Astronomical Society in Rapid City, South Dakota, and received the attention of the leading astronomical journals. Dr. Rapp of the School of Mines conducted the meeting. Dr. Rapp formerly did work for the government on these in our government efforts to solve the 're-entry' problem. However, tremendous credit must go to Mr. Newell N. White, Rapid Duplicating Co. of that city, who was instrumental in promoting their meeting. Allow me to tell you something of what Mr. White did and the surprising results; for it may give impetus to members of various gem and mineral societies.

"Realizing the keen public interest on anything pertaining to outer space, Mr. White contacted the manager of their leading department store, Donaldson's, concerning placing the display we had sent in the department store window. This was done and they used as props various models of American rockets and artificial satellites, a revolving globe, the 200" Mt. Palomar telescope, astronomical photographs, etc. The department store inserted an ad in the local paper and drew wonderful crowds. They even set up a booth and Mr. White took time from his work to explain to visitors about the importance of the tektites. The newspaper there gave this display and their meeting several write-ups and tremendous interest was aroused. The result was that the attendance at that meeting showed an increase of 530% as invitations were sent to science teachers, principals and civic-minded persons for a radius of 50 miles. This just goes to show what effort on the part of a club member such as Mr. White, coupled with an interesting and important display, will do for a club and it should stand as an example and challenge to all societies."

Note: All club members and societies should take note of above letter and see what can be done to make their own meetings more interesting not only for regular members but as an inducement in obtaining new ones.

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A few words about a new advertiser of R&M, namely, the Display-o-Lite Co., 6616 N.E. Alameda, Portland 4, Oregon.

"We will soon have a new and improved display cabinet in kit form which we think will have real appeal. As to facts about our company, they are about as follows:

The Display-o-Lite Company was formed last year by Loyal Morey and John Ward, two gem collectors of Portland, Oregon. Purpose of the company is to offer display equipment and service to gem and mineral collectors.

"Emphasis will be on the development of new ideas and the use of light in displays. Mr. Morey is a lighting specialist, and operates his own business in the design and custom building of lamps.

"The company welcomes correspondence from collectors with problems or ideas relating to gem display. We feature certain items, but we are also prepared to serve those collectors who desire special equipment that can only be obtained on a custom or semi-custom basis."

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Lobo Archery Company Box 144-R, Carlsbad, N. Mexico, now advertising

Advertise in Rocks and Minerals

in R&M features a unique do-it-yourself kit that includes:

"A 24 page booklet with complete step by step instructions and photos that show each step in the manufacture of an arrowhead. The chipping procedure then can be applied to anything that the Indian made of stone. Also included are the necessary tools, practice material and flint or chert and obsidian to make authentic looking articles."

From the Southeastern Mineral Company, P.O. Box 2537, Lakeland, Fla., we are in receipt of Shell and Fossil List No. 3, from Howard B. Graves, Jr.

"This 7 page list is quite complete as to price, size in inches, species and locality in regards to shells and fossils from world wide localities."

Note: For those so interested in such a list, write to Southeastern Mineral Company as to your desire in obtaining one.

Epidote near Bakersville, N.C.

Editor R&M:

I am sending under separate cover a few epidote crystals and an albite crystal found here on my farm about three miles northeast of Bakersville, Mitchell Co., N.C.

I am also enclosing pictures of some of the crystals I have in my collection. Though the pictures are not very good they will give some idea of the size of the crystals and groups of crystals. Most of the epidote crystals shown are doubly terminated.

The crystallized albite forms the matrix for the epidote. Some of the masses of albite crystals will weigh 20 pounds or more. Some of them have epidote crystals attached. The deposit has furnished thousands of epidote crystals ranging from six inches long, the size of the ones shown in the pictures, down to the size of a fine sewing needle. Some of the crystals were found lying loose in cavities in the albite vein. But most of them were found in a brown, soapy-feeling clay which filled the cavities. I hope to display some of my best crystals at the Federation Meeting in Asheville, N.C., August 7, 8, 9, 1958. Hope the specimens I am sending will be of some interest to you.

May 6, 1958

Clarence Wilson
Route 1, Box 91
Bakersville, N.C.

Specimens received and they consisted of one large group of beautiful, white platy albite crystals and a group of fine quality loose epidote crystals. The epidotes varied from dark green, ⅛"x1½", mostly platy crystals, translucent–semi-transparent to brownish-green, transparent needle-like crystals 1¼" long–very, very nice.

Epidote crystals found on the farm of Clarence Wilson, 3 miles N/E of Bakersville, N.C.